Statement of Basis
Hot Mix Asphalt Plant General Permit

Permit to Construct No. P-2017.0016
Project ID 61861

Staker Parson Companies dba Idaho Materials and Construction
Twin Falls, Idaho

Facility ID 083-00193

Final

July 14, 2017
Tom Burnham TB
Permit Writer

The purpose of this Statement of Basis is to satisfy the requirements of IDAPA 58.01.01.et seq, Rules for the Control of Air Pollution in Idaho, for issuing air permits.

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
ASTM	American Society for Testing and Materials
Btu	British thermal units
CAA	Clean Air Act
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent emissions
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
Eq.	equivalent to
°F	degrees Fahrenheit
GHG	greenhouse gases
HAP	hazardous air pollutants
HMA	hot mix asphalt
hp	horsepower
hr/yr	hours per consecutive 12 calendar month period
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
In	inches
lb/hr	pounds per hour
MACT	Maximum Achievable Control Technology
MMBtu	million British thermal units
MMscf	million standard cubic feet
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
O&M	operation and maintenance
PAH	polyaromatic hydrocarbons
PC	permit condition
PM	particulate matter
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
POM	polycyclic organic matter
ppm	parts per million
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
RAP	recycled asphalt pavement
RFO	reprocessed fuel oil
Rules	*Rules for the Control of Air Pollution in Idaho*
scf	standard cubic feet
SCL	significant contribution limits
SIP	State Implementation Plan
SO_2	sulfur dioxide

SO_x	sulfur oxides
T/day	tons per calendar day
T/hr	tons per hour
T/yr	tons per consecutive 12 calendar month period
TAP	toxic air pollutants
ULSD	ultra-low sulfur diesel
U.S.C.	United States Code
VOC	volatile organic compounds
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

Idaho Materials and Construction has proposed a new stationary source drum-mix asphalt plant. The asphalt plant consists of a counter-flow/parallel flow asphalt drum mixer equipped with a with a bag house to control particulate matter, an asphaltic oil storage tank with a heater, and materials transfer equipment. Materials transfer equipment at the facility will include front end loaders, feed bins, storage silos, conveyors, stock piles, and haul trucks.

Asphalt is made at the facility as follows. First, stockpiled aggregate is transferred to feed bins. The Applicant has also requested that recycled asphalt pavement (RAP) be used in the aggregate (up to 50% can be allowed). Aggregate is then dispensed from the feed bins onto feeder conveyors, which transfer the aggregate to the asphalt drum mixer. The Applicant has requested that the asphalt drum mixer be fired on natural gas, LPG/propane, #2 diesel fuel, and used oil (RFO). Next, aggregate travels through the rotating drum mixer, and when dried and heated, it is mixed with hot liquid asphaltic oil. The asphaltic oil is heated by the asphalt tank heater to allow it to flow and be mixed with the hot, dry aggregate. The resulting asphalt is conveyed to hot storage bins until it can be loaded into trucks for transport off-site or transferred to silos for temporary storage prior to transport off-site. As part of the operation, the Applicant has proposed that a portable rock crusher be allowed to be collocated at the facility.

The Applicant has proposed that line power will be used exclusively at the facility. Therefore, no IC engines powering electrical generators were included in the application.

Permitting History

This is the initial PTC for a new facility thus there is no permitting history.

Application Scope

This is the initial PTC for a new facility.

The asphalt plant will be fed a mixture of crushed fines and aggregates from a collocated crusher. The rock crusher will be permitted independently from the asphalt plant. The process begins with materials being fed via front end loader to a compartment bin feeder system and then dispensed in metered proportions to a collecting conveyor. The material will pass over a scalping screen before being conveyed into the drum mixer via a scalping screen.

Inside the drum mixer the aggregates will be heated to specification temperature and then asphaltic oil is added. In some instances up to 50% RAP may be substituted for virgin aggregate.

The mixed asphalt is dispensed to a slat conveyor and then lifted up to a hot storage silo for intermediate storage. Trucks are then loaded by driving under the hot storage silo.

The silo loading process will be enclosed and vented back to the drum via suction induced either through the conveyor or via a separate duct line. The unloading process will be uncontrolled.

All particulate emissions from the asphalt drum mixer will be collected and vented to a high efficiency baghouse with a minimum control efficiency of 99% as proposed by the Applicant.

The asphalt plant will include a hot oil heating system designed to keep asphaltic oil at specification temperature. Heat will be provided via a fuel oil or natural gas/LPG-fired external combustion burner. This burner will operate intermittently during 24-hours per day much the way a hot water heater cycles. Typical burner operation during any 24-hour period is less than 8 hours.

The Applicant has also proposed asphalt production rate throughput limits of 300 tons per hour, 5,000 tons per day, and 300,000 tons per year.

Application Chronology

March 15, 2017	DEQ received an application and an application fee.
March 27 – April 11, 2017	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
March 27, 2017	DEQ determined that the application was complete.
March 31, 2017	DEQ made available the draft permit and statement of basis for peer and regional office review.
May 4, 2017	DEQ made available the draft permit and statement of basis for applicant review.
May 25 – June 26, 2017	DEQ provided a public comment period on the proposed action.
March 27, 2017	DEQ received the permit processing fee.
July 14, 2017	DEQ issued the final permit and statement of basis.

TECHNICAL ANALYSIS

The asphalt production facility utilizes a baghouse for control of particulate matter emissions from the asphalt drum mixer. In addition, the Applicant will maintain the moisture content using water sprays, using shrouds, or will use other emissions controls to minimize PM_{10} emissions from aggregate.

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Sources	Control Equipment	Emission Point ID No.
Material Transfer Points: Materials handling Asphalt aggregate transfers Truck unloading of aggregate Aggregate conveyor transfers Aggregate handling	Using water sprays, using shrouds, or other emissions controls to meet 20% opacity limit	N/A
Asphalt Drum Mixer: Manufacturer: Gencor Model: Ultra Type: Parallel-flow Manufacture Date: 2017 Max. production: 300 T/hr, 5000 T/hr, and 300,000 T/yr Fuel(s): Natural gas, #2 fuel oil, propane and used oil (RFO) Liquid fuel sulfur content: 0.5% by weight	Asphalt Drum Mixer Baghouse: Manufacturer: Gencor Model: CFS-151 Type: Ultraflow Flow rate: 28871 dscf PM_{10} control efficiency: 99.9%	Exit height: 32 in Exit diameter: 54 in Exit flow rate: 28871 acfm Exit temperature: 400 °F
Asphaltic Oil Tank Heater: Manufacturer: General Combustion Model: HyWay Heat input rating: 1.0 MMBtu/hr Fuel(s): Natural gas, #2 fuel oil, propane, and used oil Liquid fuel sulfur content: 0.0015% by weight	N/A	Exit height: 8 ft Exit diameter: Eq. 10.7 in Exit flow rate: 451 acfm Exit temperature: 646 °F

Emissions Inventories

Potential to Emit

IDAPA 58.01.01 defines Potential to Emit as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is state or federally enforceable. Secondary emissions do not count in determining the potential to emit of a facility or stationary source.

Using this definition of Potential to Emit an emission inventory was developed for the asphalt production operations at the facility associated with this proposed project using the DEQ developed HMA EI spreadsheet (see Appendix A). Emissions estimates of criteria pollutant PTE were based on the following assumptions:

- Maximum asphalt throughput does not exceed 300 ton HMA/hour, 5,000 ton HMA/day, and 300,000 ton HMA/year (per the Applicant).
- Emissions from the asphalt drum dryer were based on the maximum emissions from using any of the proposed fuels for combustion in the drum dryer.
- Emissions from a portable rock crusher were included in the emissions modeling analysis with the assumption that when the collocated rock crusher is operating, the asphalt plant is operating at half its maximum capacity.
- Any emissions unit outside a 1,000 ft radius from the asphalt plant was not included in the emissions modeling analysis for this project.

Uncontrolled Potential to Emit

Using the definition of Potential to Emit, uncontrolled Potential to Emit is then defined as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall **not** be treated as part of its design **since** the limitation or the effect it would have on emissions **is not** state or federally enforceable.

The uncontrolled Potential to Emit is used to determine if a facility is a "Synthetic Minor" source of emissions. Synthetic Minor sources are facilities that have an uncontrolled Potential to Emit for regulated air pollutants or HAP above the applicable Major Source threshold without permit limits.

The following table presents the post project uncontrolled emissions for regulated air pollutants as submitted by the Applicant and verified by DEQ staff. Uncontrolled emissions were determined as follows:

- For the asphalt drum mixer uncontrolled emissions were assumed to be based upon four times the proposed annual throughput (4 x 300,000 T/yr = 1,200,000 T/yr).
- For the asphaltic oil tank heater controlled emissions were set to 8,760 hours per year for full-time operation as proposed by the Applicant.
- For the materials handling operation controlled and uncontrolled emissions were assumed to be equal.

The following table presents the uncontrolled Potential to Emit for criteria pollutants as calculated per the DEQ HMA EI spreadsheet. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 2 UNCONTROLLED POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Emissions Unit	$PM_{10}/PM_{2.5}$	SO_2	NO_X	CO	VOC	Lead
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Asphalt drum mixer	3.45	13.35	8.25	19.50	4.80	2.25E-03
Asphaltic oil tank heater	0.73	0.23	0.77	0.36	0.02	4.83E-05
Load-out and silo filling	1.46	0.00	0.00	3.34	5.32	0.00
Materials handling	0.64	0.00	0.00	0.00	0.00	0.00
Total	**5.64**	**13.58**	**9.02**	**23.20**	**10.14**	**2.30E-03**

The following table presents the uncontrolled Potential to Emit for HAP pollutants as calculated per the DEQ HMA EI spreadsheet. See Appendix A for a detailed presentation of the calculations emissions for each emissions unit. Worst-case HAPs emissions were based upon the same assumptions as for criteria pollutants.

Table 3 UNCONTROLLED POTENTIAL TO EMIT FOR HAZARDOUS AIR POLLUTANTS

IDAPA Listing	Hazardous Air Pollutants	Uncontrolled PTE (T/yr)
585	Dioxins	4.16501E-09
	Furans	5.78805E-09
	Acrolein	0.005416667
	Antimony	7.58128E-05
	Chromium	0.001152
	Cobalt	4.93487E-05
	Ethyl benzene	0.053390832
	Hexane	0.197269937
	Manganese	0.00162606
	Methyl chloroform	0.01
	Methyl ethyl ketone (MEK)	0.005581394
	Naphthalene	0.02268853
	Phosphorus	0.005902369
	Propionaldehyde	0.027083333
	Quinone	0.033333333
	Selenium	7.7901E-05
	Toluene	0.607563653
	Xylene	0.058675636
586	Acetaldehyde	0.044520548
	Arsenic	2.8811E-05
	Benzene	0.013565839
	Benzo(a)anthracene	1.42811E-05
	Benzo(a)pyrene	6.05339E-07
	Benzo(b)fluoranthene	5.0418E-06
	Benzo(k)fluoranthene	1.66274E-06
	Beryllium	2.02875E-07
	1,3-Butadiene	0.000
	Cadmium	1.69456E-05
	Chrysene	3.64515E-05
	Dibenzo(a,h)anthracene	4.43774E-08
	Formaldehyde	0.109242982
	Hexavalent Chromium	1.72208E-05

	Indeno(1,2,3-cd)pyrene	2.96368E-07
	3-Methylchloranthrene	1.76471E-09
	Nickel	0.002774188
Not listed	Acenaphthene	0.000123036
	Acenaphthylene	0.000759371
	Anthracene	0.000126954
	Benzo(e)pyrene	5.50386E-06
	Benzo(g,h,I)perylene	1.59288E-06
	Dichlorobenzene	1.17647E-06
	Fluoranthene	4.00917E-05
	Fluorene	0.000554668
	Isooctane	0.006
	Mercury	0.000542491
	2-Methylnaphthalene	0.006558046
	Perylene	5.47853E-06
	Phenanthrene	0.001074512
	Pyrene	0.000158744
	Total	**1.22**

Pre-Project Potential to Emit

Pre-project Potential to Emit is used to establish the change in emissions at a facility as a result of this project.

This is a new facility. Therefore, pre-project emissions are set to zero for all criteria pollutants.

Post Project Potential to Emit

The following table presents the post project Potential to Emit for criteria pollutants from all emissions units at the facility as determined by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 5 POST PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Emissions Unit	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2e
	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	T/yr[(b)]
Asphalt drum mixer	6.90	3.45	26.70	13.35	16.50	8.25	39.00	19.50	9.60	4.80	**8,468.08**
Asphaltic oil tank heater	0.02	0.73	0.016	0.23	0.17	0.77	0.08	0.36	0.05	0.02	
Load-out and silo filling	0.33	1.46	0.00	0.00	0.00	0.00	0.76	3.34	1.21	5.32	
Post Project Totals	**7.25**	**5.64**	**26.72**	**13.58**	**16.67**	**9.02**	**39.84**	**23.20**	**10.86**	**10.14**	**8,468.1**

a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.
b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.

As demonstrated in Tables 2 and 4, this facility has uncontrolled potential to emit for PM_{10}, SO_2, NO_X, CO, and VOC, and CO_2e emissions less than the Major Source threshold of 100 T/yr and 100,000 T/yr respectively and a controlled potential to emit for PM_{10}, SO_2, NO_X, CO, and VOC, and CO_2e emissions less than the Major Source threshold of 100 T/yr and 100,000 T/yr respectively. In addition, as demonstrated in Table 3, this facility has an uncontrolled potential to emit for HAP emissions less than the Major Source threshold of 10 T/yr for any one HAP and 25 T/y for all HAPs combined. Therefore, this facility is designated as a Minor facility.

Change in Potential to Emit

The change in facility-wide potential to emit is used to determine if a public comment period may be required and to determine the processing fee per IDAPA 58.01.01.225. The following table presents the facility-wide change in the potential to emit for criteria pollutants.

Table 6 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Emissions	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2e
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	T/yr
Pre-Project Potential to Emit	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Post Project Potential to Emit	**7.25**	**5.64**	**26.72**	**13.58**	**16.67**	**9.02**	**39.84**	**23.20**	**10.86**	**10.14**	**8,468.1**
Changes in Potential to Emit	**7.25**	**5.64**	**26.72**	**13.58**	**16.67**	**9.02**	**39.84**	**23.20**	**10.86**	**10.14**	**8,468.1**

Non-Carcinogenic TAP Emissions

A summary of the estimated PTE emissions increase of non-carcinogenic toxic air pollutants (TAPs) is provided in the following table.

Table 7 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR NON-CARCINOGENIC TOXIC AIR POLLUTANTS

Non-Carcinogenic Toxic Air Pollutants	Pre-Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Post Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Change in 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Non-Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Acetone	0.00E-03	0.174718555	0.174718555	119	No
Acrolein	0.00E-03	5.42E-03	5.42E-03	0.017	No
Antimony	0.00E-03	7.58128E-05	7.58128E-05	0.033	No
Barium	0.00E-03	0.001227088	0.001227088	2	No
Carbon disulfide	0.00E-03	0.000518861	0.000518861	0.033	No
Chromium metal (II and III)	0.00E-03	0.001152	0.001152	0.033	No
Cobalt metal dust, and fume	0.00E-03	4.93487E-05	4.93487E-05	0.0033	No
Copper (fume)	0.00E-03	0.000658677	0.000658677	0.013	No
Crotonaldehyde	0.00E-03	0.017916667	0.017916667	0.38	No
Cumene	0.00E-03	0.000953092	0.000953092	16.3	No
Ethyl benzene	0.00E-03	5.34E-02	5.34E-02	29	No
Ethyl chloride (Chloroethane)	0.00E-03	7.14E-04	7.14E-04	176	No
Heptane	0.00E-03	1.958333333	1.958333333	109	No
Hexane	0.00E-03	1.97E-01	1.97E-01	12	No
Manganese as Mn (fume)	0.00E-03	0.00162606	0.00162606	0.067	No
Mercury (alkyl compounds as Hg)	0.00E-03	0.000542491	0.000542491	0.001	No
Methyl bromide	0.00E-03	0.000207585	0.000207585	1.27	No
Methyl chloride (Chloromethane)	0.00E-03	6.85501E-06	6.85501E-06	6.867	No
Methyl chloroform	0.00E-03	1.00E-02	1.00E-02	127	No
Methyl ethyl ketone (MEK)	0.00E-03	5.58E-03	5.58E-03	39.3	No
Molybdenum (soluble)	0.00E-03	5.74327E-06	5.74327E-06	0.333	No
Pentane	0.00E-03	2.55E-03	2.55E-03	118	No
Phenol	0.00E-03	0.000838137	0.000838137	1.27	No
Phosphorous	0.00E-03	0.005902369	0.005902369	0.007	No
Propionaldehyde	0.00E-03	2.71E-02	2.71E-02	0.0287	No
Quinone	**0.00E-03**	**3.33E-02**	**3.33E-02**	**0.027**	**Yes**
Selenium	0.00E-03	7.7901E-05	7.7901E-05	0.013	No
Silver as Ag (soluble)	0.00E-03	0.0001	0.0001	0.001	No
Styrene monomer	0.00E-03	0.000200351	0.000200351	6.67	No
Thallium	0.00E-03	8.54167E-07	8.54167E-07	0.007	No
Toluene	0.00E-03	6.08E-01	6.08E-01	25	No
Trichloroethylene	0.00E-03	0	0	17.93	No
Vanadium as V_2O_5, (respirable dust and fume)	0.00E-03	0.000232066	0.000232066	0.003	No
Xylene	0.00E-03	5.87E-02	5.87E-02	29	No
Zinc metal	0.00E-03	0.012920696	0.012920696	0.667	No

One of the PTEs for non-carcinogenic TAPs was exceeded as a result of this project. Therefore, modeling is required for Quinone because the 24-hour average non-carcinogenic screening ELs identified in IDAPA 58.01.01.586 were exceeded.

Carcinogenic TAP Emissions

A summary of the estimated PTE for emissions increase of carcinogenic TAPs is provided in the following table.

Table 8 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR CARCINOGENIC TOXIC AIR POLLUTANTS

Carcinogenic Toxic Air Pollutants	Pre-Project Annual Average Emissions Rates for Units at the Facility (lb/hr)	Post Project Annual Average Emissions Rates for Units at the Facility (lb/hr)	Change in Annual Average Emissions Rates for Units at the Facility (lb/hr)	Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Acetaldehyde	**0.00E-03**	**4.45E-02**	**4.45E-02**	**3.0E-03**	**Yes**
Arsenic	**0.00E-03**	**2.88E-05**	**2.88E-05**	**1.5E-06**	**Yes**
Benzene	**0.00E-03**	**1.36E-02**	**1.36E-02**	**8.0E-04**	**Yes**
Beryllium and compounds	0.00E-03	2.03E-07	2.03E-07	2.8E-05	No
Cadmium and compounds	**0.00E-03**	**1.69E-05**	**1.69E-05**	**3.7E-06**	**Yes**
Chromium (VI)	**0.00E-03**	**1.72E-05**	**1.72E-05**	**5.6E-07**	**Yes**
Dichloromethane	0.00E-03	6.86E-06	6.86E-06	1.6E-03	No
Formaldehyde	**0.00E-03**	**1.09E-01**	**1.09E-01**	**5.1E-04**	**Yes**
Nickel	**0.00E-03**	**2.77E-03**	**2.77E-03**	**2.7E-05**	**Yes**
PAHs Total	0.00E-03	3.22E-02	3.22E-02	9.1E-05	No
POM Total[c]	**0.00E-03**	**5.84E-05**	**5.84E-05**	**2.0E-06**	**Yes**
Tetrachloroethylene	0.00E-03	6.67E-05	6.67E-05	1.3E-02	No

c) Polycyclic Organic Matter (POM) is considered as one TAP comprised of: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indeno(1,2,3-cd)pyrene, benzo(a)pyrene. The total is compared to benzo(a)pyrene.

Some of the PTEs for carcinogenic TAPs were exceeded as a result of this project. Therefore, modeling is required for Acetaldehyde, Arsenic, Benzene, Cadmium, Chromium, Formaldehyde, Nickel, and POM because the annual average carcinogenic screening ELs identified in IDAPA 58.01.01.586 were exceeded.

Post Project HAP Emissions

The following table presents the post project potential to emit for hazardous air pollutants (HAPs) pollutants from all emissions units at the facility as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 9 POTENTIAL TO EMIT FOR HAZARDOUS AIR POLLUTANTS EMISSIONS

IDAPA Listing	Hazardous Air Pollutants	Uncontrolled PTE (T/yr)
585	Dioxins	4.16501E-09
	Furans	5.78805E-09
	Acrolein	0.005416667
	Antimony	7.5737E-05
	Chromium	0.001150848
	Cobalt	4.92993E-05
	Ethyl benzene	0.053390832
	Hexane	0.197269937
	Manganese	0.001624434
	Methyl chloroform	0.01
	Methyl ethyl ketone (MEK)	0.005581394
	Naphthalene	0.02268853

	Phosphorus	0.005902369
	Propionaldehyde	0.027083333
	Quinone	0.033333333
	Selenium	7.78231E-05
	Toluene	0.60695609
	Xylene	0.058675636
586	Acetaldehyde	0.044520548
	Arsenic	2.87822E-05
	Benzene	0.013565839
	Benzo(a)anthracene	1.42811E-05
	Benzo(a)pyrene	6.05339E-07
	Benzo(b)fluoranthene	5.0418E-06
	Benzo(k)fluoranthene	1.66274E-06
	Beryllium	2.02672E-07
	Cadmium	1.69286E-05
	Chrysene	3.64515E-05
	Dibenzo(a,h)anthracene	4.43774E-08
	Formaldehyde	0.109242982
	Hexavalent Chromium	1.72036E-05
	Indeno(1,2,3-cd)pyrene	2.96368E-07
	3-Methylchloranthrene	1.76471E-09
	Nickel	0.002771413
Not listed	Acenaphthene	0.000123036
	Acenaphthylene	0.000759371
	Anthracene	0.000126954
	Benzo(e)pyrene	5.50386E-06
	Benzo(g,h,l)perylene	1.59288E-06
	Dichlorobenzene	1.17647E-06
	Fluoranthene	4.00917E-05
	Fluorene	0.000554668
	Isooctane	0.006
	Mercury	0.000542491
	2-Methylnaphthalene	0.006558046
	Perylene	5.47853E-06
	Phenanthrene	0.001074512
	Pyrene	0.000158744
	Total	**1.22**

The estimated PTE for all federally listed HAPs combined is below 25 T/yr and no PTE for a federally listed HAP exceeds 10 T/yr. Therefore, this facility is not a Major Source for HAPs.

Ambient Air Quality Impact Analyses

As presented in the Modeling Memo in Appendix B, the estimated emission rates of PM10, $PM_{2.5}$, SO_2, NO_X, CO, VOC, HAP, and TAP from this project were below applicable screening emission levels (EL) and published DEQ modeling thresholds established in IDAPA 58.01.01.585-586 and in the State of Idaho Air Quality Modeling Guideline[1]. Refer to the Emissions Inventories section for additional information concerning the emission inventories.

The applicant has demonstrated pre-construction compliance to DEQ's satisfaction that emissions from this facility will not cause or significantly contribute to a violation of any ambient air quality standard. The applicant has also demonstrated pre-construction compliance to DEQ's satisfaction that the emissions increase due to this permitting action will not exceed any acceptable ambient concentration (AAC) or acceptable ambient concentration for carcinogens (AACC) for toxic air pollutants (TAP). A summary of the Ambient Air Impact Analysis for TAP is provided in Appendix B.

An ambient air quality impact analysis document has been crafted by DEQ based on a review of the modeling analysis submitted in the application. That document is part of the final permit package for this permitting action (see Appendix B).

As a result of the ambient air quality impact analysis, as well as information submitted by the Applicant for specific operating scenarios, the following conditions (along with corresponding monitoring and record keeping requirements) were placed in the permit:

- The Emissions Limits permit condition,
- The Asphalt Production Limits permit condition,
- The Reduced Asphalt Production Limits permit condition,
- The Allowable Raw Materials permit condition,

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

The facility is located in Twin Falls County, which is designated as attainment or unclassifiable for $PM_{2.5}$, PM_{10}, SO_2, NO_2, CO, and Ozone. Refer to 40 CFR 81.313 for additional information.

Facility Classification

As demonstrated in Tables 2 and 4 above, this facility has uncontrolled potential to emit for PM_{10}, SO_2, NO_X, CO, and VOC, and CO_2e emissions less than the Major Source threshold of 100 T/yr and 100,000 T/yr respectively and a controlled potential to emit for PM_{10}, SO_2, NO_X, CO, and VOC, and CO_2e emissions less than the Major Source threshold of 100 T/yr and 100,000 T/yr respectively. In addition, as demonstrated in Table 3, this facility has an uncontrolled potential to emit for HAP emissions less than the Major Source threshold of 10 T/yr for any one HAP and 25 T/y for all HAPs combined. Therefore, this facility is designated as a Minor facility.

Permit to Construct (IDAPA 58.01.01.201)

IDAPA 58.01.01.201 Permit to Construct Required

The permittee has requested that a PTC be issued to the facility for the proposed new emissions source. Therefore, a permit to construct is required to be issued in accordance with IDAPA 58.01.01.220. This permitting action was processed in accordance with the procedures of IDAPA 58.01.01.200-228.

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[1] Criteria pollutant thresholds in Table 1, State of Idaho Air Quality Modeling Guideline, Doc ID AQ-011, rev. 1, December 31, 2002.

Tier II Operating Permit (IDAPA 58.01.01.401)

IDAPA 58.01.01.401 Tier II Operating Permit

The application was submitted for a permit to construct (refer to the Permit to Construct section), and an optional Tier II operating permit has not been requested. Therefore, the procedures of IDAPA 58.01.01.400–410 were not applicable to this permitting action.

Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.625 Visible Emissions

The sources of PM_{10} emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Condition 3.5.

Fugitive Emissions (IDAPA 58.01.01.650)

IDAPA 58.01.01.650 Rules for the Control of Fugitive Emissions

The sources of fugitive emissions at this facility are subject to the State of Idaho fugitive emissions standards. These requirements are assured by Permit Conditions 2.2, 2.3, and 2.10.

Particulate Matter – New Equipment Process Weight Limitations (IDAPA 58.01.01.701)

IDAPA 58.01.01.701 Particulate Matter – New Equipment Process Weight Limitations

IDAPA 58.01.01.700 through 703 set PM emission limits for process equipment based on when the piece of equipment commenced operation and the piece of equipment's process weight (PW) in pounds per hour (lb/hr). IDAPA 58.01.01.701 and IDAPA 58.01.01.702 establish PM emission limits for equipment that commenced operation on or after October 1, 1979 and for equipment operating prior to October 1, 1979, respectively.

For equipment that commenced operation on or after October 1, 1979, the PM allowable emission rate (E) is based on one of the following four equations:

IDAPA 58.01.01.701.01.a: If PW is < 9,250 lb/hr; $E = 0.045\ (PW)^{0.60}$

IDAPA 58.01.01.701.01.b: If PW is ≥ 9,250 lb/hr; $E = 1.10\ (PW)^{0.25}$

For equipment that commenced prior to October 1, 1979, the PM allowable emission rate is based on one of the following equations:

IDAPA 58.01.01.702.01.a: If PW is < 17,000 lb/hr; $E = 0.045\ (PW)^{0.60}$

IDAPA 58.01.01.702.01.b: If PW is ≥ 17,000 lb/hr; $E = 1.12\ (PW)^{0.27}$

For the new asphalt drum mixer emissions unit proposed to be installed as a result of this project with a proposed throughput of 300 T/hr, E is calculated as follows:

Proposed throughput = 300 T/hr x 2,000 lb/1 T = 600,000 lb/hr

Therefore, E is calculated as:

$E = 1.10 \times PW^{0.25} = 1.10 \times (600{,}000)^{0.25} = 31$ lb-PM/hr

As presented previously in the Emissions Inventories Section of this evaluation the post project PTE for this emissions unit is 6.9 lb-$PM_{10}/PM_{2.5}$ per hour. Assuming PM is 50% $PM_{10}/PM_{2.5}$ means that PM emissions will be 13.8 lb-PM/hr (7 lb- $PM_{10}/PM_{2.5}$ per hour ÷ 0.5 lb-$PM_{10}/PM_{2.5}$ per lb-PM). This is less than the calculated Rule requirement PM emissions rate of 31 lb-PM/hr. Therefore, compliance with this requirement has been demonstrated.

Rules for Control of Odors (IDAPA 58.01.01.775)

IDAPA 58.01.01.750 Rules for Control of Odors

Section 776.01 states that no person shall allow, suffer, cause, or permit the emission of odorous gases, liquids, or solids into the atmosphere in such quantities as to cause air pollution. These requirements are assured by Permit Conditions 2.5 and 2.8.

Rules for Control of Hot-Mix Asphalt Plants (IDAPA 58.01.01.805)

IDAPA 58.01.01.805 Rules for Control of Hot-Mix Asphalt Plants

The purpose of Sections 805 through 808 is to establish for hot-mix asphalt plants restrictions on the emission of particulate matter.

Section 806 states that no person shall cause, allow or permit a hot-mix asphalt plant to have particulate emissions which exceed the limits specified in Sections 700 through 703. As demonstrated previously, these requirements have been met by the proposed PM_{10} emissions rate (see Section on Particulate Matter – New Equipment Process Weight Limitations).

Section 807 states that in the case of more than one stack to a hot-mix asphalt plant, the emission limitation will be based on the total emission from all stacks. The proposed facility only has one stack for emissions from the asphalt drum dryer so there is no need to combine emissions limits from multiple stacks into one stack as required.

Section 808.01 requires fugitive emission controls as follows: No person shall cause, allow or permit a plant to operate that is not equipped with an efficient fugitive dust control system. The system shall be operated and maintained in such a manner as to satisfactorily control the emission of particulate material from any point other than the stack outlet.

Section 808.02 requires plant property dust controls as follows: The owner or operator of the plant shall maintain fugitive dust control of the plant premises and plant owned, leased or controlled access roads by paving, oil treatment or other suitable measures. Good operating practices, including water spraying or other suitable measures, shall be employed to prevent dust generation and atmospheric entrainment during operations such as stockpiling, screen changing and general maintenance.

These requirements are assured by Permit Conditions 2.1 and 2.2.

Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70)

IDAPA 58.01.01.301 Requirement to Obtain Tier I Operating Permit

Post project facility-wide emissions from this facility do not have a potential to emit greater than 100 tons per year for PM_{10}, SO_2, NO_X, CO, VOC, and HAP or 10 tons per year for any one HAP or 25 tons per year for all HAP combined as demonstrated previously in the Emissions Inventories Section of this analysis. Therefore, the facility is not a Tier I source in accordance with IDAPA 58.01.01.006 and the requirements of IDAPA 58.01.01.301 do not apply.

PSD Classification (40 CFR 52.21)

40 CFR 52.21 Prevention of Significant Deterioration of Air Quality

The facility is not a major stationary source as defined in 40 CFR 52.21(b)(1), nor is it undergoing any physical change at a stationary source not otherwise qualifying under paragraph 40 CFR 52.21(b)(1) as a major stationary source, that would constitute a major stationary source by itself as defined in 40 CFR 52. Therefore in accordance with 40 CFR 52.21(a)(2), PSD requirements are not applicable to this permitting action. The facility is/is not a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a), and does not have facility-wide emissions of any criteria pollutant that exceed 250 T/yr.

NSPS Applicability (40 CFR 60)

Because the facility produces asphalt the following NSPS Subparts are applicable:

- 40 CFR 60, Subpart I - National Standards of Performance for Hot Mix Asphalt Plants

DEQ has been delegated authority to this subpart.

Those sections that are applicable are highlighted.

40 CFR 60, Subpart I **National Standards of Performance for Hot Mix Asphalt Plants**

This permitting action is for a new asphalt plant. Therefore, the requirements of this subpart may apply.

§ 60.90 Applicability and designation of affected facility

In accordance with §60.90(a), each hot mix asphalt facility is an affected facility. In accordance with §60.90(b), any hot mix asphalt facility that commences construction or modification after June 11, 1973 is subject to the requirements of Subpart I.

The affected facility includes: the dryer; systems for screening, handling, storing, and weighing hot aggregate; systems for loading, transferring, and storing mineral filler; systems for mixing hot mix asphalt; and the loading, transfer, and storage systems associated with emission control systems.

§ 60.91 Definitions

This section contains the definitions of this subpart.

§ 60.92 Standard for particulate matter

In accordance with §60.92, no owner or operator shall discharge or cause the discharge into the atmosphere from any affected facility any gases which contain particulate matter in excess of 0.04 gr/dscf or exhibit 20% opacity or greater. Permit Condition 3.4 includes the requirements of this section.

§ 60.93 Test methods and procedures

In accordance with §60.93(a), performance tests shall use as reference methods and procedures the test methods in Appendix A of 40 CFR 60.

In accordance with §60.93(b), compliance with the particulate matter standards shall be determined by EPA Reference Method 5, and opacity shall be determined by EPA Reference Method 9. Permit Conditions 3.14 and 3.15 includes the requirements of this section.

NESHAP Applicability (40 CFR 61)

The facility is not subject to any NESHAP requirements in 40 CFR 61.

MACT Applicability (40 CFR 63)

- The facility is not subject to any NESHAP requirements in 40 CFR 63.

Permit Conditions Review

This section describes the permit conditions for this initial permit or only those permit conditions that have been added, revised, modified or deleted as a result of this permitting action.

Permit condition 1.1 establishes the permit to construct scope.

Permit condition, Table 1.1, provides a description of the purpose of the permit and the regulated sources, the process, and the control devices used at the facility.

Facility-Wide Conditions

As discussed previously, permit condition 2.1 establishes that the permittee shall take all reasonable precautions to prevent fugitive particulate matter (PM) from becoming airborne and provides examples of the controls in accordance with IDAPA 58.01.01.650-651.

As discussed previously, permit condition 2.2 establishes that the asphalt plant shall employ efficient fugitive dust controls and provides examples of the controls in accordance with IDAPA 58.01.01.808.01 and 808.02.

Permit condition 2.3 establishes that the asphalt plant shall not collocate with a rock crushing plant, any other asphalt plant, or a concrete batch plant as requested by the Applicant.

Permit condition 2.4 establishes that the asphalt plant may collocate with one rock crushing plant and shall not locate with 1,000 ft. of another rock crushing plant, any other asphalt plant, or a concrete batch plant as requested by the Applicant.

Permit condition 2.5 establishes that there are to be no emissions of odorous gases, liquids, or solids from the permit equipment into the atmosphere in such quantities that cause air pollution.

As discussed previously, permit condition 2.6 establishes that the permittee shall monitor fugitive dust emissions on a daily basis to demonstrate compliance with the facility-wide permit requirements.

Permit condition 2.7 establishes that the permittee measure and record the distances to equipment that will be collocated with the asphalt plant to demonstrate compliance with the Collocation Restrictions permit condition.

Permit condition 2.8 establishes that the permittee monitor and record odor complaints to demonstrate compliance with the facility-wide permit requirements.

Permit Condition 2.9 establishes that the permittee shall maintain records as required by the Recordkeeping General Provision.

Asphalt Production Equipment

Permit condition 3.1 provides a process description of the asphalt production process at this facility.

Permit condition 3.2 provides a description of the control devices used on the asphalt production equipment at this facility.

Permit condition 3.3 establishes hourly and annual emissions limits for $PM_{2.5}$, SO_2, NO_X, CO, and VOC emissions from the asphalt production operation at this facility.

As discussed previously permit condition 3.4 incorporates the particulate matter and opacity standards of 40 CFR 60, Subpart I – Standards of Performance for Hot Mix Asphalt Plants.

As discussed previously, Permit Condition 3.5 establishes a 20% opacity limit for the asphalt drum mixer baghouse stack, the asphaltic oil tank heater stack, the load-out station stack(s), and the silo filling slat conveyor stacks or functionally equivalent openings associated with the asphalt production operation.

Permit Condition 3.6 establishes an hourly, a daily, and an annual asphalt production limit for the asphalt production operation as proposed by the Applicant.

Permit Condition 3.7 establishes a daily asphalt production limit for the asphalt production operation when operated on days when a collocated portable rock crusher is operated. This requirement was based upon the air quality modeling analysis performed for this application.

Permit Condition 3.8 establishes limits for the raw materials used in the asphalt production operation as proposed by the Applicant.

Permit Condition 3.9 establishes that a baghouse be used to control emissions from the asphalt drum mixer as proposed by the Applicant.

Permit Condition 3.10 establishes fuel use restrictions for combustion in the asphalt drum mixer based upon 40 CFR 279.11. These fuel use restrictions were based on the fuels proposed by the Applicant to be combusted in the asphalt drum mixer.

Permit Condition 3.11 establishes fuel use restrictions for combustion in the asphaltic oil tank heater. These fuel use restrictions were based on the fuels proposed by the Applicant to be combusted in the asphaltic oil tank heater.

Permit Condition 3.12 establishes PM performance testing requirements as required by 40 CFR 60, Subpart I for Hot Mix Asphalt Plants.

Permit Condition 3.13 establishes PM testing methods and procedures as required by 40 CFR 60, Subpart I for Hot Mix Asphalt Plants.

Permit Condition 3.14 establishes $PM_{2.5}$ performance testing requirements required by DEQ on asphalt plants located in the state of Idaho.

Permit Condition 3.15 establishes $PM_{2.5}$ performance testing methods and procedures required by DEQ on asphalt plants located in the state of Idaho.

Permit condition 3.16 establishes that the permittee monitor asphalt production, visible emissions, RAP percentage usage, and the fuel combusted in the asphalt drum mixer during the performance tests to establish the validity of the performance tests.

Permit condition 3.17 establishes that the Permittee monitor and record hourly and daily asphalt production to demonstrate compliance with the Asphalt Production Limits permit condition.

Permit condition 3.18 establishes that the Permittee calculate and record RAP use to demonstrate compliance with the Allowable Raw Materials permit condition.

Permit condition 3.19 establishes that the Permittee shall establish procedures for operating the baghouse. This is a DEQ imposed standard requirement for operations using baghouses to control particulate emissions.

Permit condition 3.20 establishes that the permittee monitor distillate fuel oil shipments to demonstrate compliance with operating permit requirements.

Permit condition 3.21 establishes that the permittee monitor and record biodiesel and biodiesel blends fuel shipments to demonstrate compliance with operating permit requirements.

Permit condition 3.22 establishes that the permittee monitor used oil fuel shipments to demonstrate compliance with the used oil fuel requirements of the permit.

Permit Condition 3.23 establishes that the permittee shall maintain records as required by the Recordkeeping General Provision.

Permit Condition 3.24 establishes that the permittee shall submit the results of the performance tests to the appropriate DEQ office.

Permit condition 3.25 establishes that the federal requirements of 40 CFR Part 60, Subpart I – Standards of Performance for Hot Mix Asphalt Plants, are incorporated by reference into the requirements of this permit per current DEQ guidance.

Permit Condition 3.26 incorporates 40 CFR 60, Subpart A – General Provisions.

PUBLIC REVIEW

Public Comment Opportunity

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c or IDAPA 58.01.01.404.01.c. During this time, there were comments on the application and there was/was not a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

Public Comment Period

A public comment period was made available to the public in accordance with IDAPA 58.01.01.209.01.c. During this time, comments were submitted in response to DEQ's proposed action. Refer to the chronology for public comment period dates.

A response to public comments document has been crafted by DEQ based on comments submitted during the public comment period. That document is part of the final permit package for this permitting action.

APPENDIX A – EMISSIONS INVENTORIES

CURRENT PTC APPLICATION VALUES

DEQ Verification Worksheets: Hot Mix Asphalt (HMA) Drum Mix Facility Data

Facility ID/AIRS No.	083-00193	Spreadsheet Date	5/25/2017 10:50
Permit No.	P-2017.0016	DEQ Version Date	7/20/2011
Facility Owner/Company Name:	STAKER PARSON COMPANIES dba IDAHO MATERIALS AND CONSTRUCTION		
Address:	1310 Addison Ave. West		
City, State, Zip:	Twin Falls, ID 83301		
Facility Contact:	Patrick Clark		
Contact Number/ e-mail:	801-430-3116/pclark@stakerparson.com		
		Include Silo Fill & Loadout Emissions?	Y
Use Short Term Source Factor on 586 ELs? Y/N	N	Use T-RACT on 586 AACC? Y/N	N
Hot Mix Plant AP-42 Section 11.1	**Input (Bold Color) or Calculated Value (Black)**	**Fuel Type(s)**	**Fuel Type Toggle ("0" or "1")**
Drum Dryer Make/Model	**Gencor/300**	Distallate (#2) Fuel Oil	**1**
Rated heat input capacity, MMBtu/hr	**100**	Used Oil or RFO4 Oil	**1**
Drum Dryer Hourly HMA Production, Tons/hour	**300**	Natural Gas	**1**
Max Production Per day, Tons per day	**5,000**	LPG or Propane	**1**
Max Annual HMA Production, Tons/year	**300,000**	Default #2 fuel oil and used oil sulfur content percentage by weight	0.0015% and 0.5%
Min Hours of operation per year (annual/max hourly production)	1,000	#2 Fuel Oil Max Sulfur Content	**0.0015%**
		Used Oil/RFO4 Oil Max Sulfur Content	**0.5000%**

Asphaltic Oil Tank Heater AP-42, Section 11.1 (oil or natural gas fuel), or Section 1.4 (natural gas fuel)			
Rated heat input capacity, MMBtu/hr	**1.000**	**Fuel Type(s)**	**Fuel Toggle**
Hours of operation per day	**24**	#2 Fuel Oil	**1**
Operation, days per year	365.00	Fuel oil sulfur content	**0.0015%**
Max Hours of operation per year	8,760	Natural Gas	**1**

Asphaltic Oil Tank Heater Fuel Consumption Calculations	**#2 Fuel Oil**	**Natural Gas**
Heat Input Rating, MMBtu/hr	1.000	1.000
Fuel Heating Value, Btu/gal (oil) or Btu/scf (gas)	137,030	**1,020**
Heating Value Correction for Natural Gas EFs, see Note	n/a	1.000
Theoretical Max Fuel Use Rate gal/hr [oil] or scf/hr [gas]	7.30	980
Max Operational Hours per Year	8,760	8,760
Note: AP-42 EFs for natural gas and diesel combustion are based on heat value of 1,020 Btu/scf and 137,030 Btu/gal		

IC Engine EI Conversion Factors			
1 hp = 0.7456999 kW	0.7457	1 lb = (g)	453.59
Avg brake-specific fuel consumption (BSFC) = 7000 Btu/hp-hr	7000	Fuel Heating Value, Btu/gal	137,030
Note: AP-42 Tables 3.3-x,3.4-x: avg. diesel heating value is based on 19,300 Btu/lb with density equal 7.1 lb/gal=> Btu/gal =			137,030

NOTE: THE HMA EI SUMMARY WORKSHEETS ONLY ALLOWS ONE SMALL AND/OR ONE LARGE IC ENGINE.

IC Engine 1 < 600 bhp (447 kW) AP-42 Section 3.3 (diesel fueled)			
IC Engine Make/Model	**make/model**	**Fuel Type(s)**	**IC Engine Toggle**
IC Engine Max Rated Power (bhp)	**0**	#2 Fuel Oil (Diesel)	**1**
IC Engine Max Rated Capacity (kW)	0	Max Sulfur weight percentage	**0.0015%**
		Max Operational Hours/Day	**0**
IC Engine 1 EPA Certification:	**0**	Max Operational Hours/Year	**0**
Not EPA-certified: Enter "0" (zero)		Calculated Max Fuel Use Rate, gal/hr	0.00
Certified Tier I, Tier 2, or Tier 3: Enter 1, 2, or 3		Calculated MMBtu/hr	0.00
Certified "BLUE SKY" engine: Enter 4			

ERROR - IC ENGINE 2 RATING IS LESS THAN 600 bhp

IC Engine 2 > 600 bhp (447 kW) AP-42 Section 3.4 (diesel fueled)			
IC Engine Make/Model	**make/model**	**Fuel Type(s)**	**IC Engine Toggle**
IC Engine Rated Capacity (bhp)	**0**	#2 Fuel Oil (Diesel)	**1**
IC Engine Max Rated Capacity (kW)	0	Max Sulfur weight percentage	**0.0015%**
		Max Operational Hours per Day	**0**
IC Engine 2 EPA Certification:	**0**	Max Operational Hours per Year	**0**
Not EPA-certified: Enter "0" (zero)		Calculated Max Fuel Use Rate, gal/hr	0.00
Certified Tier I, Tier 2, or Tier 3: Enter 1, 2, or 3		Calculated MMBtu/hr	0.00
Certified "BLUE SKY" engine: Enter 5			

Aggregate Handling - Fugitive Emissions		
U = mean wind speed (miles per hour)	**10**	
Moisture/Control % Considerations:		
AP-42 Table 11.19.2-2, Note b. Moisture content of uncontrolled sources ranged from 0.21 to 1.3%		
AP-42 Table 11.19.2-2, Note b. Moisture content of controlled (water spray) sources ranged from 0.55 to 2.88% -->		
		--> ~91.3% control for screening, ~95% control for conveyor tı
M = moisture content (%)	**3**	Bulk aggregate for HMAstypically stabilizes at 3 to 5% by weight.
If higher moisture is maintained, apply additional % control:	**90.00%**	For M=3% add 10% control. For M=5% add 15% control. 90% cont
Number of front-end loader drop points (aggregate and RAP) (DEQ Assumption)	2	Drops to storage pile(s) and drop(s) to bins
Aggregate weigh conveyor transfer points (DEQ Assumption)	2	Transfer from bins to conveyor & from conveyor to scalping screen
Number of scalping screens (DEQ Assumption)	1	Includes all aggregate and RAP tonnage.
Aggregate conveyor transfer to drum (DEQ Assumption)	1	Includes all aggregate and RAP tonnage.

Facility: STAKER PARSON COMPANIES dba IDAHO MATERIALS AND CONSTRUCTION
5/25/2017 10:50 **Permit/Facility ID:** P-2017.0016 083-00193

Used Oil Fired Drum Mix Asphalt Plant With Fabric Filter AP-42 Section 11.1

Fuel Type Toggle =	1	
Max Hourly Production	300	T/hr
Max Daily Production	5,000	Tons/day
Max Annual Production	300,000	Tons/yr

User Input Weight % Sulfur = 0.5000%
AP-42 EF of 0.058 lb SO2/ton presumed based on #2 oil, max 0.5% sulfur content
SO2 emissions are multiplied by a factor: User Input Value/0.5% = 1.00

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PM (total) [b]	0.033	9.90	4.95	
PM-10 (total) [b]	0.023	6.90	3.45	
PM-2.5 [b1]	0.0223	6.69	3.35	
CO [c]	0.13	39.00	19.50	
NOx [c]	0.055	16.50	8.25	
SO_2 [c]	0.089	26.70	13.35	
VOC [d]	0.032	9.60	4.80	
Lead	1.50E-05	4.50E-03	2.25E-03	
HCl [d,e]	0.00021	0.063	3.15E-02	
Dioxins[e,f]				
2,3,7,8-TCDD	2.10E-13	6.30E-11	3.15E-11	**7.19E-12**
Total TCDD	9.30E-13	2.79E-10	1.40E-10	**3.18E-11**
1,2,3,7,8-PeCDD	3.10E-13	9.30E-11	4.65E-11	**1.06E-11**
Total PeCDD	2.20E-11	6.60E-09	3.30E-09	**7.53E-10**
1,2,3,4,7,8-HxCDD	4.20E-13	1.26E-10	6.30E-11	**1.44E-11**
1,2,3,6,7,8-HxCDD	1.30E-12	3.90E-10	1.95E-10	**4.45E-11**
1,2,3,7,8,9-HxCDD	9.80E-13	2.94E-10	1.47E-10	**3.36E-11**
Total HxCDD	1.20E-11	3.60E-09	1.80E-09	**4.11E-10**
1,2,3,4,6,7,8-Hp-CDD	4.80E-12	1.44E-09	7.20E-10	**1.64E-10**
Total HpCDD	1.90E-11	5.70E-09	2.85E-09	**6.51E-10**
Octa CDD	2.50E-11	7.50E-09	3.75E-09	**8.56E-10**
Total PCDD[h]	7.90E-11	2.37E-08	1.19E-08	**2.71E-09**
Furans[e,f]				
2,3,7,8-TCDF	9.70E-13	2.91E-10	1.46E-10	**3.32E-11**
Total TCDF	3.70E-12	1.11E-09	5.55E-10	**1.27E-10**
1,2,3,7,8-PeCDF	4.30E-12	1.29E-09	6.45E-10	**1.47E-10**
2,3,4,7,8-PeCDF	8.40E-13	2.52E-10	1.26E-10	**2.88E-11**
Total PeCDF	8.40E-11	2.52E-08	1.26E-08	**2.88E-09**
1,2,3,4,7,8-HxCDF	4.00E-12	1.20E-09	6.00E-10	**1.37E-10**
1,2,3,6,7,8-HxCDF	1.20E-12	3.60E-10	1.80E-10	**4.11E-11**
2,3,4,6,7,8-HxCDF	1.90E-12	5.70E-10	2.85E-10	**6.51E-11**
1,2,3,7,8,9-HxCDF	8.40E-12	2.52E-09	1.26E-09	**2.88E-10**
Total HxCDF	1.30E-11	3.90E-09	1.95E-09	**4.45E-10**
1,2,3,4,6,7,8-HpCDF	6.50E-12	1.95E-09	9.75E-10	**2.23E-10**
1,2,3,4,7,8,9-HpCDF	2.70E-12	8.10E-10	4.05E-10	**9.25E-11**
Total HpCDF	1.00E-11	3.00E-09	1.50E-09	**3.42E-10**
Octa CDF	4.80E-12	1.44E-09	7.20E-10	**1.64E-10**
Total PCDF[h]	4.00E-11	1.20E-08	6.00E-09	**1.37E-09**
Total PCDD/PCDF[h]	1.20E-10	3.60E-08	1.80E-08	**4.11E-09**
Non-PAH HAPs[f]				
Acetaldehyde[e]	1.30E-03	3.90E-01	1.95E-01	**4.45E-02**
Acrolein[e]	2.60E-05	7.80E-03	3.90E-03	5.42E-03
Benzene[e]	3.90E-04	1.17E-01	5.85E-02	**1.34E-02**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	7.20E-02	3.60E-02	5.00E-02
Formaldehyde[e]	3.10E-03	9.30E-01	4.65E-01	**1.06E-01**
Hexane[e]	9.20E-04	2.76E-01	1.38E-01	1.92E-01
Isooctane	4.00E-05	1.20E-02	6.00E-03	8.33E-03
Methyl Ethyl Ketone[e]	2.00E-05	6.00E-03	3.00E-03	4.17E-03
Pentane[e]				
Propionaldehyde[e]	1.30E-04	3.90E-02	1.95E-02	2.71E-02
Quinone[e]	1.60E-04	4.80E-02	2.40E-02	3.33E-02
Methyl chloroform[e]	4.80E-05	1.44E-02	7.20E-03	1.00E-02
Toluene[e]	2.90E-03	8.70E-01	4.35E-01	6.04E-01
Xylene[e]	2.00E-04	6.00E-02	3.00E-02	4.17E-02
POM (7-PAH Group)		1.64E-04		**1.88E-05**

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene	1.70E-04	5.10E-02	2.55E-02	**5.82E-03**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	4.20E-04	2.10E-04	**4.79E-05**
Acenaphthylene	2.20E-05	6.60E-03	3.30E-03	**7.53E-04**
Anthracene	3.10E-06	9.30E-04	4.65E-04	**1.06E-04**
Benzo(a)anthracene	2.10E-07	6.30E-05	3.15E-05	**7.19E-06**
Benzo(a)pyrene[e]	9.80E-09	2.94E-06	1.47E-06	**3.36E-07**
Benzo(b)fluoranthene	1.00E-07	3.00E-05	1.50E-05	**3.42E-06**
Benzo(e)pyrene	1.10E-07	3.30E-05	1.65E-05	**3.77E-06**
Benzo(g,h,i)perylene	4.00E-08	1.20E-05	6.00E-06	**1.37E-06**
Benzo(k)fluoranthene	4.10E-08	1.23E-05	6.15E-06	**1.40E-06**
Chrysene	1.80E-07	5.40E-05	2.70E-05	**6.16E-06**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	1.83E-04	9.15E-05	**2.09E-05**
Fluorene	1.10E-05	3.30E-03	1.65E-03	**3.77E-04**
Indeno(1,2,3-cd)pyrene	7.00E-09	2.10E-06	1.05E-06	**2.40E-07**
Naphthalene[e]	6.50E-04	1.95E-01	9.75E-02	**2.23E-02**
Perylene	8.80E-09	2.64E-06	1.32E-06	**3.01E-07**
Phenanthrene	2.30E-05	6.90E-03	3.45E-03	**7.88E-04**
Pyrene	3.00E-06	9.00E-04	4.50E-04	**1.03E-04**
Non-HAP Organic Compounds[f]				
Acetone[e]	8.30E-04	2.49E-01	1.25E-01	1.73E-01
Benzaldehyde	1.10E-04	3.30E-02	1.65E-02	2.29E-02
Butane	6.70E-04	2.01E-01	1.01E-01	1.40E-01
Butyraldehyde	1.60E-04	4.80E-02	2.40E-02	3.33E-02
Crotonaldehyde[e]	8.60E-05	2.58E-02	1.29E-02	1.79E-02
Ethylene	7.00E-03	2.10E+00	1.05E+00	1.46E+00
Heptane	9.40E-03	2.82E+00	1.41E+00	1.96E+00
Hexanal	1.10E-04	3.30E-02	1.65E-02	2.29E-02
Isovaleraldehyde	3.20E-05	9.60E-03	4.80E-03	6.67E-03
2-Methyl-1-pentene	4.00E-03	1.20E+00	6.00E-01	8.33E-01
2-Methyl-2-butene	5.80E-04	1.74E-01	8.70E-02	1.21E-01
3-Methylpentane	1.90E-04	5.70E-02	2.85E-02	3.96E-02
1-Pentene	2.20E-03	6.60E-01	3.30E-01	4.58E-01
n-Pentane	2.10E-04	6.30E-02	3.15E-02	4.38E-02
Valeraldehyde[e]	6.70E-05	2.01E-02	1.01E-02	1.40E-02
Metals[g]				
Antimony[e]	1.80E-07	5.40E-05	2.70E-05	3.75E-05
Arsenic[e]	5.60E-07	1.68E-04	8.40E-05	**1.92E-05**
Barium[e]	5.80E-06	1.74E-03	8.70E-04	1.21E-03
Beryllium[e]				
Cadmium[e]	4.10E-07	1.23E-04	6.15E-05	**1.40E-05**
Chromium[e]	5.50E-06	1.65E-03	8.25E-04	1.15E-03
Cobalt[e]	2.60E-08	7.80E-06	3.90E-06	5.42E-06
Copper[e]	3.10E-06	9.30E-04	4.65E-04	6.46E-04
Hexavalent Chromium[e]	4.50E-07	1.35E-04	6.75E-05	**1.54E-05**
Manganese[e]	7.70E-06	2.31E-03	1.16E-03	1.60E-03
Mercury[e]	2.60E-06	7.80E-04	3.90E-04	5.42E-04
Molybdenum[e]				
Nickel[e]	6.30E-05	1.89E-02	9.45E-03	**2.16E-03**
Phosphorus[e]	2.80E-05	8.40E-03	4.20E-03	5.83E-03
Silver[e]	4.80E-07	1.44E-04	7.20E-05	1.00E-04
Selenium[e]	3.50E-07	1.05E-04	5.25E-05	7.29E-05
Thallium[e]	4.10E-09	1.23E-06	6.15E-07	8.54E-07
Vanadium[e]				
Zinc[e]	6.10E-05	1.83E-02	9.15E-03	1.27E-02

a) Emission factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
b) AP-42, Table 11.1-3, Particulate Matter Emission Factors for Drum Mix Hot Asphalt Plants, 3/04
b1) AP-42, Table 11.1-4, Summary of Particle Size Distribution for Drum Mix Dryers **(Emission Rating Factor E - "Poor")**
c) AP-42, Table 11.1-7, Emission Factors for CO. CO2, NOx, and SO2 from Drum Mix Hot Asphalt Plants, 3/04
In addition, for SO2 emissions the AP-42 EF of 0.058 lb/ton was adjusted twice. First, to account for the average sulfur content of the fuel used during the source test (0.44% by weight, three tests on waste oil), 0.058 to 0.066. Second, to account for the average scavenging factor of 63% down to 50%, 0.062 to 0.089.
d) AP-42, Table 11.1-8, Emission Factors for TOC, Methane, VOC, and HCl from Drum Mix Hot Asphalt Plants, 3/04
e) IDAPA Toxic Air Pollutant
f) AP-42, Table 11.1-10, Emission Factors for Organic Pollutant Emissions from Drum Mix Hot Asphalt Plants, 3/04
g) AP-42, Table 11.1-12, Emission Factors for Metal Emissions from Drum Mix Hot Mix Asphalt Plants, 3/04
h) Compound is classified as polycyclic organic matter, as defined in the 1990 CAAA. Total PCDD is the sum of the total tetra through octa dioxins; total PCDF is sum of the total tetra through octa furans; and total PCDD/PCDF is the sum of total PCDD and total PCDF.
Pollutants shown in bold/blue text are emitted when using Used Oil but not when using #2 Fuel Oil or Natural Gas.
Pollutants shown in magenta are emitted when using Used Oil or #2 Fuel Oil, but not when using Natural Gas

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.
Pollutants shown in blue text are emitted only when burning Used Oil, but not when burning #2 Fuel Oil or Natural Gas

Facility: STAKER PARSON COMPANIES dba IDAHO MATERIALS AND CONSTRUCTION
5/25/2017 10:50 Permit/ Facility ID: P-2017.0016 083-00193

Natural Gas Fired Drum Mix Asphalt Plant With Fabric Filter AP-42 Section 11.1

Fuel Type Toggle =	1	
Max Hourly Production	300	Tons/hr
Max Daily Production	5,000	Tons/day
Max Annual Production	300,000	Tons/yr (Proposed Throughput Limit)

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total)[b]	0.033	9.90	4.95	
PM-10 (total)[b]	0.023	6.90	3.45	
PM-2.5 [b1]	0.0223	6.69	3.35	
CO [c]	0.13	39.00	19.50	
NOx [c]	0.026	7.80	3.90	
SO_2 [c]	0.0034	1.02	0.51	
VOC [d]	0.032	9.60	4.80	
Lead	6.20E-07	1.86E-04	9.30E-05	
HCl [d,e]	No Data			
Dioxins[e]				
-- No EFs for Natural Gas Fuel --				
Furans[e]				
-- No EFs for Natural Gas Fuel --				
Non-PAH HAPs[f]				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]	3.90E-04	1.17E-01	5.85E-02	**1.34E-02**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	7.20E-02	3.60E-02	5.00E-02
Formaldehyde[e]	3.10E-03	9.30E-01	4.65E-01	**1.06E-01**
Hexane[e]	9.20E-04	2.76E-01	1.38E-01	1.92E-01
Isooctane	4.00E-05	1.20E-02	6.00E-03	8.33E-03
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]	4.80E-05	1.44E-02	7.20E-03	1.00E-02
Toluene[e]	1.50E-04	4.50E-02	2.25E-02	3.13E-02
Xylene[e]	2.00E-04	6.00E-02	3.00E-02	4.17E-02
POM (7-PAH Group)		3.40E-02		**3.89E-03**

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPS Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene	7.40E-05	2.22E-02	1.11E-02	**2.53E-03**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	4.20E-04	2.10E-04	**4.79E-05**
Acenaphthylene	8.60E-06	2.58E-03	1.29E-03	**2.95E-04**
Anthracene	2.20E-07	6.60E-05	3.30E-05	**7.53E-06**
Benzo(a)anthracene	2.10E-07	6.30E-05	3.15E-05	**7.19E-06**
Benzo(a)pyrene[e]	9.80E-09	2.94E-06	1.47E-06	**3.36E-07**
Benzo(b)fluoranthene	1.00E-07	3.00E-05	1.50E-05	**3.42E-06**
Benzo(e)pyrene	1.10E-07	3.30E-05	1.65E-05	**3.77E-06**
Benzo(g,h,l)perylene	4.00E-08	1.20E-05	6.00E-06	**1.37E-06**
Benzo(k)fluoranthene	4.10E-08	1.23E-05	6.15E-06	**1.40E-06**
Chrysene	1.80E-07	5.40E-05	2.70E-05	**6.16E-06**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	1.83E-04	9.15E-05	**2.09E-05**
Fluorene	3.80E-06	1.14E-03	5.70E-04	**1.30E-04**
Indeno(1,2,3-cd)pyrene	7.00E-09	2.10E-06	1.05E-06	**2.40E-07**
Naphthalene[e]	9.00E-05	2.70E-02	1.35E-02	**3.08E-03**
Perylene	8.80E-09	2.64E-06	1.32E-06	**3.01E-07**
Phenanthrene	7.60E-06	2.28E-03	1.14E-03	**2.60E-04**
Pyrene	5.40E-07	1.62E-04	8.10E-05	**1.85E-05**
Non-HAPs Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane	6.70E-04	2.01E-01	1.01E-01	1.40E-01
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	7.00E-03	2.10E+00	1.05E+00	1.46E+00
Heptane	9.40E-03	2.82E+00	1.41E+00	1.96E+00
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene	4.00E-03	1.20E+00	6.00E-01	8.33E-01
2-Methyl-2-butene	5.80E-04	1.74E-01	8.70E-02	1.21E-01
3-Methylpentane	1.90E-04	5.70E-02	2.85E-02	3.96E-02
1-Pentene	2.20E-03	6.60E-01	3.30E-01	4.58E-01
n-Pentane	2.10E-04	6.30E-02	3.15E-02	4.38E-02
Valeraldehyde				
Metals[g]				
Antimony[e]	1.80E-07	5.40E-05	2.70E-05	3.75E-05
Arsenic[e]	5.60E-07	1.68E-04	8.40E-05	1.92E-05
Barium[e]	5.80E-06	1.74E-03	8.70E-04	1.21E-03
Beryllium[e]				
Cadmium[e]	4.10E-07	1.23E-04	6.15E-05	**1.40E-05**
Chromium[e]	5.50E-06	1.65E-03	8.25E-04	1.15E-03
Cobalt[e]	2.60E-08	7.80E-06	3.90E-06	5.42E-06
Copper[e]	3.10E-06	9.30E-04	4.65E-04	6.46E-04
Hexavalent Chromium[e]	4.50E-07	1.35E-04	6.75E-05	**1.54E-05**
Manganese[e]	7.70E-06	2.31E-03	1.16E-03	1.60E-03
Mercury[e]	2.40E-07	7.20E-05	3.60E-05	5.00E-05
Molybdenum[e]				
Nickel[e]	6.30E-05	1.89E-02	9.45E-03	**2.16E-03**
Phosphorus[e]	2.80E-05	8.40E-03	4.20E-03	5.83E-03
Silver[e]	4.80E-07	1.44E-04	7.20E-05	1.00E-04
Selenium[e]	3.50E-07	1.05E-04	5.25E-05	7.29E-05
Thallium[e]	4.10E-09	1.23E-06	6.15E-07	8.54E-07
Vanadium[e]				
Zinc[e]	6.10E-05	1.83E-02	9.15E-03	1.27E-02

a) Emission factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
b) AP-42, Table 11.1-3, Particulate Matter Emission Factors for Drum Mix Hot Asphalt Plants, 3/04
b1) AP-42, Table 11.1-4, Summary of Particle Size Distribution for Drum Mix Dryers **(Emission Rating Factor E - "Poor")**
c) AP-42, Table 11.1-7, Emission Factors for CO. CO2, NOx, and SO2 from Drum Mix Hot Asphalt Plants, 3/04
d) AP-42, Table 11.1-8, Emission Factors for TOC, Methane, VOC, and HCl from Drum Mix Hot Asphalt Plants, 3/04
e) IDAPA Toxic Air Pollutant
f) AP-42, Table 11.1-10, Emission Factors for Organic Pollutant Emissions from Drum Mix Hot Asphalt Plants, 3/04
g) AP-42, Table 11.1-12, Emission Factors for Metal Emissions from Drum Mix Hot Mix Asphalt Plants, 3/04

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Facility: STAKER PARSON COMPANIES dba IDAHO MATERIALS AND CONSTRUCTION
5/25/2017 10:50 **Permit/Facility ID: P-2017.0016 083-00193**

#2 Fuel Oil Fired Drum Mix Asphalt Plant With Fabric Filter AP-42 Section 11.1

Fuel Type Toggle =	1	
Hourly Production	300	T/hr
Daily Production	5,000	Tons/day
Max Annual Production	300,000	Tons/yr

User Input Weight % Sulfur = 0.0015%
AP-42 EF of 0.058 lb SO2/ton presumed based on #2 oil, max 0.5% sulfur content
SO2 emissions are multiplied by a factor: User Input Value/0.5% = 0.003

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr) Maximum	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total) [b]	0.033	9.90	4.95	
PM-10 (total) [b]	0.023	6.90	3.45	
PM-2.5 [b1]	0.0223	6.69	3.35	
CO [c]	0.13	39.00	19.50	
NOx [c]	0.055	16.50	8.25	
SO_2 [c]	0.089	0.08	0.04	
VOC [d]	0.032	9.60	4.80	
Lead	1.50E-05	4.50E-03	2.25E-03	
HCl [d,e]	No Data			
Dioxins[e]				
2,3,7,8-TCDD	2.10E-13	6.3E-11	3.15E-11	**7.19E-12**
Total TCDD	9.30E-13	2.79E-10	1.40E-10	**3.18E-11**
1,2,3,7,8-PeCDD	3.10E-13	9.3E-11	4.65E-11	**1.06E-11**
Total PeCDD	2.20E-11	6.6E-09	3.30E-09	**7.53E-10**
1,2,3,4,7,8-HxCDD	4.20E-13	1.26E-10	6.30E-11	**1.44E-11**
1,2,3,6,7,8-HxCDD	1.30E-12	3.9E-10	1.95E-10	**4.45E-11**
1,2,3,7,8,9-HxCDD	9.80E-13	2.94E-10	1.47E-10	**3.36E-11**
Total HxCDD	1.20E-11	3.6E-09	1.80E-09	**4.11E-10**
1,2,3,4,6,7,8-Hp-CDD	4.80E-12	1.44E-09	7.20E-10	**1.64E-10**
Total HpCDD	1.90E-11	5.7E-09	2.85E-09	**6.51E-10**
Octa CDD	2.50E-11	7.5E-09	3.75E-09	**8.56E-10**
Total PCDD[h]	7.90E-11	2.37E-08	1.19E-08	**2.71E-09**
Furans[e]				
2,3,7,8-TCDF	9.70E-13	2.91E-10	1.46E-10	**3.32E-11**
Total TCDF	3.70E-12	1.11E-09	5.55E-10	**1.27E-10**
1,2,3,7,8-PeCDF	4.30E-12	1.29E-09	6.45E-10	**1.47E-10**
2,3,4,7,8-PeCDF	8.40E-13	2.52E-10	1.26E-10	**2.88E-11**
Total PeCDF	8.40E-11	2.52E-08	1.26E-08	**2.88E-09**
1,2,3,4,7,8-HxCDF	4.00E-12	1.2E-09	6.00E-10	**1.37E-10**
1,2,3,6,7,8-HxCDF	1.20E-12	3.6E-10	1.80E-10	**4.11E-11**
2,3,4,6,7,8-HxCDF	1.90E-12	5.7E-10	2.85E-10	**6.51E-11**
1,2,3,7,8,9-HxCDF	8.40E-12	2.52E-09	1.26E-09	**2.88E-10**
Total HxCDF	1.30E-11	3.9E-09	1.95E-09	**4.45E-10**
1,2,3,4,6,7,8-HpCDF	6.50E-12	1.95E-09	9.75E-10	**2.23E-10**
1,2,3,4,7,8,9-HpCDF	2.70E-12	8.1E-10	4.05E-10	**9.25E-11**
Total HpCDF	1.00E-11	3E-09	1.50E-09	**3.42E-10**
Octa CDF	4.80E-12	1.44E-09	7.20E-10	**1.64E-10**
Total PCDF[h]	4.00E-11	1.2E-08	6.00E-09	**1.37E-09**
Total PCDD/PCDF[h]	1.20E-10	3.6E-08	1.80E-08	**4.11E-09**
Non-PAH HAPs[f]				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]	3.90E-04	1.17E-01	5.85E-02	**1.34E-02**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	7.20E-02	3.60E-02	5.00E-02
Formaldehyde[e]	3.10E-03	9.30E-01	4.65E-01	**1.06E-01**
Hexane[e]	9.20E-04	2.76E-01	1.38E-01	1.92E-01
Isooctane	4.00E-05	1.20E-02	6.00E-03	8.33E-03
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]	4.80E-05	1.44E-02	7.20E-03	1.00E-02
Toluene[e]	2.90E-03	8.70E-01	4.35E-01	6.04E-01
Xylene[e]	2.00E-04	6.00E-02	3.00E-02	4.17E-02
POM (7-PAH Group)		1.64E-04		**1.88E-05**

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr) Maximum	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene	0.00017	5.10E-02	2.55E-02	**5.82E-03**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	4.20E-04	2.10E-04	**4.79E-05**
Acenaphthylene	2.20E-05	6.60E-03	3.30E-03	**7.53E-04**
Anthracene	3.10E-06	9.30E-04	4.65E-04	**1.06E-04**
Benzo(a)anthracene	2.10E-07	6.30E-05	3.15E-05	**7.19E-06**
Benzo(a)pyrene[e]	9.80E-09	2.94E-06	1.47E-06	**3.36E-07**
Benzo(b)fluoranthene	1.00E-07	3.00E-05	1.50E-05	**3.42E-06**
Benzo(e)pyrene	1.10E-07	3.30E-05	1.65E-05	**3.77E-06**
Benzo(g,h,l)perylene	4.00E-08	1.20E-05	6.00E-06	**1.37E-06**
Benzo(k)fluoranthene	4.10E-08	1.23E-05	6.15E-06	**1.40E-06**
Chrysene	1.80E-07	5.40E-05	2.70E-05	**6.16E-06**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	1.83E-04	9.15E-05	**2.09E-05**
Fluorene	1.10E-05	3.30E-03	1.65E-03	**3.77E-04**
Indeno(1,2,3-cd)pyrene	7.00E-09	2.10E-06	1.05E-06	**2.40E-07**
Naphthalene[e]	0.00065	1.95E-01	9.75E-02	**2.23E-02**
Perylene	8.80E-09	2.64E-06	1.32E-06	**3.01E-07**
Phenanthrene	2.30E-05	6.90E-03	3.45E-03	**7.88E-04**
Pyrene	3.00E-06	9.00E-04	4.50E-04	**1.03E-04**
Non-HAP Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane	6.70E-04	2.01E-01	1.01E-01	1.40E-01
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	7.00E-03	2.10E+00	1.05E+00	1.46E+00
Heptane	9.40E-03	2.82E+00	1.41E+00	1.96E+00
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene	4.00E-03	1.20E+00	6.00E-01	8.33E-01
2-Methyl-2-butene	5.80E-04	1.74E-01	8.70E-02	1.21E-01
3-Methylpentane	1.90E-04	5.70E-02	2.85E-02	3.96E-02
1-Pentene	2.20E-03	6.60E-01	3.30E-01	4.58E-01
n-Pentane	2.10E-04	6.30E-02	3.15E-02	4.38E-02
Valeraldehyde				
Metals[g]				
Antimony[e]	1.80E-07	5.40E-05	2.70E-05	3.75E-05
Arsenic[e]	5.60E-07	1.68E-04	8.40E-05	**1.92E-05**
Barium[e]	5.80E-06	1.74E-03	8.70E-04	1.21E-03
Beryllium[e]				
Cadmium[e]	4.10E-07	1.23E-04	6.15E-05	**1.40E-05**
Chromium[e]	5.50E-06	1.65E-03	8.25E-04	1.15E-03
Cobalt[e]	2.60E-08	7.80E-06	3.90E-06	5.42E-06
Copper[e]	3.10E-06	9.30E-04	4.65E-04	6.46E-04
Hexavalent Chromium[e]	4.50E-07	1.35E-04	6.75E-05	**1.54E-05**
Manganese[e]	7.70E-06	2.31E-03	1.16E-03	1.60E-03
Mercury[e]	2.60E-06	7.80E-04	3.90E-04	5.42E-04
Molybdenum[e]				
Nickel[e]	6.30E-05	1.89E-02	9.45E-03	**2.16E-03**
Phosphorus[e]	2.80E-05	8.40E-03	4.20E-03	5.83E-03
Silver[e]	4.80E-07	1.44E-04	7.20E-05	1.00E-04
Selenium[e]	3.50E-07	1.05E-04	5.25E-05	7.29E-05
Thallium[e]	4.10E-09	1.23E-06	6.15E-07	8.54E-07
Vanadium[e]				
Zinc[e]	6.10E-05	1.83E-02	9.15E-03	1.27E-02

a) Emission factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
b) AP-42, Table 11.1-3, Particulate Matter Emission Factors for Drum Mix Hot Asphalt Plants, 3/04
b1) AP-42, Table 11.1-4, Summary of Particle Size Distribution for Drum Mix Dryers **(Emission Rating Factor E - "Poor")**
c) AP-42, Table 11.1-7, Emission Factors for CO. CO2, NOx, and SO2 from Drum Mix Hot Asphalt Plants, 3/04
In addition, for SO2 emissions the AP-42 EF of 0.058 lb/ton was adjusted twice. First, to account for the average sulfur content of the fuel used during the source test (0.44% by weight, three tests on waste oil), 0.058 to 0.066. Second, to account for the average scavenging factor of 63% down to 50%, 0.062 to 0.089.
d) AP-42, Table 11.1-8, Emission Factors for TOC, Methane, VOC, and HCl from Drum Mix Hot Asphalt Plants, 3/04
e) IDAPA Toxic Air Pollutant
f) AP-42, Table 11.1-10, Emission Factors for Organic Pollutant Emissions from Drum Mix Hot Asphalt Plants, 3/04
g) AP-42, Table 11.1-12, Emission Factors for Metal Emissions from Drum Mix Hot Mix Asphalt Plants, 3/04
h) Compound is classified as polycyclic organic matter, as defined in the 1990 CAAA. Total PCDD is the sum of the total tetra through octa dioxins; total PCDF is sum of the total tetra through octa furans; and total PCDD/PCDF is the sum of total PCDD and total PCDF.

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Facility: STAKER PARSON COMPANIES dba IDAHO MATERIALS AND CONSTRUCTION
5/25/2017 10:50 **Permit/ Facility ID: P-2017.0016 083-00193**

LPG or Propane Fired Drum Mix Asphalt Plant With Fabric Filter

Fuel Type Toggle =	1	
Max Hourly Production	300	Tons/hr
Max Daily Production	5,000	Tons/day
Max Annual Production	300,000	Tons/yr

Note: Presumes same emissions as natural gas except for NOx (see AP-42, Section 1.5, Liquefied Petroleum Gas Combustion)
SO2 emissions from natural gas are ~70% lower than with #2 Fuel Oil, and ~94% lower than with Used Oil or #6 Fuel Oil (minimal impact on emissions, used Nat Gas EF)

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total)[b]	0.033	9.90	4.95	
PM-10 (total)[b]	0.023	6.90	3.45	
PM-2.5 [b1]	0.0223	6.69	3.35	
CO [c]	0.13	39.00	19.50	
NOx [c1] (Natural Gas EF x 1.5)	0.039	11.70	5.85	
SO_2 [c]	0.0034	1.02	0.51	
VOC [d]	0.032	9.60	4.80	
Lead	6.20E-07	0.000186	9.30E-05	
HCl [d,e]	No Data			
Dioxins[e]				
-- No EFs for LP Gas or Propane Fuel --				
Furans[e]				
-- No EFs for LP Gas or Propane Fuel --				
Non-PAH HAPs[f]				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]	3.90E-04	1.17E-01	5.85E-02	**1.34E-02**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	7.20E-02	3.60E-02	5.00E-02
Formaldehyde[e]	3.10E-03	9.30E-01	4.65E-01	**1.06E-01**
Hexane[e]	9.20E-04	2.76E-01	1.38E-01	1.92E-01
Isooctane	4.00E-05	1.20E-02	6.00E-03	8.33E-03
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]	4.80E-05	1.44E-02	7.20E-03	1.00E-02
Toluene[e]	1.50E-04	4.50E-02	2.25E-02	3.13E-02
Xylene[e]	2.00E-04	6.00E-02	3.00E-02	4.17E-02
POM (7-PAH Group)		1.64E-04		**1.88E-05**

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene	7.40E-05	2.22E-02	1.11E-02	**2.53E-03**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	4.20E-04	2.10E-04	**4.79E-05**
Acenaphthylene	8.60E-06	2.58E-03	1.29E-03	**2.95E-04**
Anthracene	2.20E-07	6.60E-05	3.30E-05	**7.53E-06**
Benzo(a)anthracene	2.10E-07	6.30E-05	3.15E-05	**7.19E-06**
Benzo(a)pyrene[e]	9.80E-09	2.94E-06	1.47E-06	**3.36E-07**
Benzo(b)fluoranthene	1.00E-07	3.00E-05	1.50E-05	**3.42E-06**
Benzo(e)pyrene	1.10E-07	3.30E-05	1.65E-05	**3.77E-06**
Benzo(g,h,l)perylene	4.00E-08	1.20E-05	6.00E-06	**1.37E-06**
Benzo(k)fluoranthene	4.10E-08	1.23E-05	6.15E-06	**1.40E-06**
Chrysene	1.80E-07	5.40E-05	2.70E-05	**6.16E-06**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	1.83E-04	9.15E-05	**2.09E-05**
Fluorene	3.80E-06	1.14E-03	5.70E-04	**1.30E-04**
Indeno(1,2,3-cd)pyrene	7.00E-09	2.10E-06	1.05E-06	**2.40E-07**
Naphthalene[e]	9.00E-05	2.70E-02	1.35E-02	**3.08E-03**
Perylene	8.80E-09	2.64E-06	1.32E-06	**3.01E-07**
Phenanthrene	7.60E-06	2.28E-03	1.14E-03	**2.60E-04**
Pyrene	5.40E-07	1.62E-04	8.10E-05	**1.85E-05**
Non-HAPs Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane	6.70E-04	2.01E-01	1.01E-01	1.40E-01
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	7.00E-03	2.10E+00	1.05E+00	1.46E+00
Heptane	9.40E-03	2.82E+00	1.41E+00	1.96E+00
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene	4.00E-03	1.20E+00	6.00E-01	8.33E-01
2-Methyl-2-butene	5.80E-04	1.74E-01	8.70E-02	1.21E-01
3-Methylpentane	1.90E-04	5.70E-02	2.85E-02	3.96E-02
1-Pentene	2.20E-03	6.60E-01	3.30E-01	4.58E-01
n-Pentane	2.10E-04	6.30E-02	3.15E-02	4.38E-02
Valeraldehyde				
Metals[g]				
Antimony[e]	1.80E-07	5.40E-05	2.70E-05	3.75E-05
Arsenic[e]	5.60E-07	1.68E-04	8.40E-05	**1.92E-05**
Barium[e]	5.80E-06	1.74E-03	8.70E-04	1.21E-03
Beryllium[e]				
Cadmium[e]	4.10E-07	1.23E-04	6.15E-05	**1.40E-05**
Chromium[e]	5.50E-06	1.65E-03	8.25E-04	1.15E-03
Cobalt[e]	2.60E-08	7.80E-06	3.90E-06	5.42E-06
Copper[e]	3.10E-06	9.30E-04	4.65E-04	6.46E-04
Hexavalent Chromium[e]	4.50E-07	1.35E-04	6.75E-05	**1.54E-05**
Manganese[e]	7.70E-06	2.31E-03	1.16E-03	1.60E-03
Mercury[e]	2.40E-07	7.20E-05	3.60E-05	5.00E-05
Molybdenum[e]				
Nickel[e]	6.30E-05	1.89E-02	9.45E-03	**2.16E-03**
Phosphorus[e]	2.80E-05	8.40E-03	4.20E-03	5.83E-03
Silver[e]	4.80E-07	1.44E-04	7.20E-05	1.00E-04
Selenium[e]	3.50E-07	1.05E-04	5.25E-05	7.29E-05
Thallium[e]	4.10E-09	1.23E-06	6.15E-07	8.54E-07
Vanadium[e]				
Zinc[e]	6.10E-05	1.83E-02	9.15E-03	1.27E-02

a) Emission factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
b) AP-42, Table 11.1-3, Particulate Matter Emission Factors for Drum Mix Hot Asphalt Plants, 3/04
b1) AP-42, Table 11.1-4, Summary of Particle Size Distribution for Drum Mix Dryers **(Emission Rating Factor E - "Poor")**
c) AP-42, Table 11.1-7, Emission Factors for CO. CO2, NOx, and SO2 from Drum Mix Hot Asphalt Plants, 3/04
c1) AP-42, Table 1.5-1, Emission Factors for LPG Combustion, note (a): "Assumes emissions (except SOx and NOx) are the same, on a heat input basis, as for natural gas combustion. The NOx emission factors have been multiplied by a factor of 1.5, which is the approximate ration of propane/butane NOx emissions to natural gas NOx emissions.
d) AP-42, Table 11.1-8, Emission Factors for TOC, Methane, VOC, and HCl from Drum Mix Hot Asphalt Plants, 3/04
e) IDAPA Toxic Air Pollutant
f) AP-42, Table 11.1-10, Emission Factors for Organic Pollutant Emissions from Drum Mix Hot Asphalt Plants, 3/04
g) AP-42, Table 11.1-12, Emission Factors for Metal Emissions from Drum Mix Hot Mix Asphalt Plants, 3/04

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Asphalt Tank Heater - #2 Oil Fired, Estimated Emissions Using AP-42 Sections 11.1 (HMA Plants) & 1.3 (Fuel Oil Combustion)

Fuel Type Toggle = 1
Fuel Consumption Rate 7.30 gal/hr
Max Daily Operation 24 hr/day
Max Annual Operation 8,760 hrs/yr

User Input Weight % Sulfur = 0.0015%
AP-42 1.3-1 EF is 0.142S lb SO2 per gallon of fuel oil

Pollutant	Emission Factor[a] (lb/gal)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PM (total) [b] (filterable+cond)	0.0033	2.41E-02	0.11	
PM-10 (total) [b] (filterable+cond)	0.0023	1.68E-02	0.07	
PM-2.5 (total) [b] (filterable+cond)	0.00154	0.011	0.05	
CO [b] ("C" EF Rating Factor)	0.005	3.65E-02	0.16	
NOx [b]	0.024	1.75E-01	0.77	
SO_2 [b]	0.000213	0.00	0.01	
VOC [d] (NMTOC EF)	5.56E-04	4.06E-03	1.78E-02	
Lead[f]	1.51E-06	1.10E-05	4.83E-05	
HCl [e]				
Dioxins[e]				
2,3,7,8-TCDD				
Total TCDD				
1,2,3,7,8-PeCDD				
Total PeCDD				
1,2,3,4,7,8-HxCDD[c]	6.90E-13	5.04E-12	2.21E-11	**5.04E-12**
1,2,3,6,7,8-HxCDD				
1,2,3,7,8,9-HxCDD[c]	7.60E-13	5.55E-12	2.43E-11	**5.55E-12**
Total HxCDD				
1,2,3,4,6,7,8-Hp-CDD[c]	1.50E-11	1.09E-10	4.79E-10	**1.09E-10**
Total HpCDD[c]	2.00E-11	1.46E-10	6.39E-10	**1.46E-10**
Octa CDD[c]	1.60E-10	1.17E-09	5.11E-09	**1.17E-09**
Total PCDD[c]	2.00E-10	1.46E-09	6.39E-09	**1.46E-09**
Furans[e]				
2,3,7,8-TCDF				
Total TCDF[c]	3.30E-12	2.41E-11	1.05E-10	**2.41E-11**
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF[c]	4.80E-13	3.50E-12	1.53E-11	**3.50E-12**
1,2,3,4,7,8-HxCDF				
1,2,3,6,7,8-HxCDF				
2,3,4,6,7,8-HxCDF				
1,2,3,7,8,9-HxCDF				
Total HxCDF[c]	2.00E-12	1.46E-11	6.39E-11	**1.46E-11**
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF[c]	9.70E-12	7.08E-11	3.10E-10	**7.08E-11**
Octa CDF[c]	1.20E-11	8.76E-11	3.84E-10	**8.76E-11**
Total PCDF[c]	3.10E-11	2.26E-10	9.91E-10	**2.26E-10**
Total PCDD/PCDF[c]	2.30E-10	1.68E-09	7.35E-09	**1.68E-09**
Non-PAH HAPs				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]				
1,3-Butadiene[e]				
Ethylbenzene[e]				
Formaldehyde[c,e]	3.50E-06	2.55E-05	1.12E-04	**2.55E-05**
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[e]				
Xylene[e]				
POM (7-PAH Group)		7.30E-07		**7.30E-07**

Pollutant	Emission Factor[a] (lb/gal)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PAH HAPs				
2-Methylnaphthalene				
3-Methylchloranthrene[e]				
Acenaphthene[c]	5.30E-07	3.87E-06	1.69E-05	**3.87E-06**
Acenaphthylene[c]	2.00E-07	1.46E-06	6.39E-06	**1.46E-06**
Anthracene[c]	1.80E-07	1.31E-06	5.75E-06	**1.31E-06**
Benzo(a)anthracene				
Benzo(a)pyrene[e]				
Benzo(b)fluoranthene[c]	1.00E-07	7.30E-07	3.20E-06	**7.30E-07**
Benzo(e)pyrene				
Benzo(g,h,l)perylene				
Benzo(k)fluoranthene				
Chrysene				
Dibenzo(a.h)anthracene				
Dichlorobenzene				
Fluoranthene[c]	4.40E-08	3.21E-07	1.41E-06	**3.21E-07**
Fluorene[c]	3.20E-08	2.34E-07	1.02E-06	**2.34E-07**
Indeno(1,2,3-cd)pyrene				
Naphthalene[c,e]	1.70E-05	1.24E-04	5.43E-04	**1.24E-04**
Perylene				
Phenanthrene[c]	4.90E-06	3.58E-05	1.57E-04	**3.58E-05**
Pyrene[c]	3.20E-08	2.34E-07	1.02E-06	**2.34E-07**
Non-HAP Organic Compounds				
Acetone[e]				
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals[f]				
Antimony[e]	5.25E-06	3.83E-05	1.68E-04	3.83E-05
Arsenic[e]	1.32E-06	9.63E-06	4.22E-05	**9.63E-06**
Barium[e]	2.57E-06	1.88E-05	8.21E-05	1.88E-05
Beryllium[e]	2.78E-08	2.03E-07	8.89E-07	**2.03E-07**
Cadmium[e]	3.98E-07	2.90E-06	1.27E-05	**2.90E-06**
Chromium[e]	8.45E-07	6.17E-06	2.70E-05	6.17E-06
Cobalt[e]	6.02E-06	4.39E-05	1.92E-04	4.39E-05
Copper[e]	1.76E-06	1.28E-05	5.63E-05	1.28E-05
Hexavalent Chromium[e]	2.48E-07	1.81E-06	7.93E-06	**1.81E-06**
Manganese[e]	3.00E-06	2.19E-05	9.59E-05	2.19E-05
Mercury[e]	1.13E-07	8.25E-07	3.61E-06	8.25E-07
Molybdenum[e]	7.87E-07	5.74E-06	2.52E-05	5.74E-06
Nickel[e]	8.45E-05	6.17E-04	2.70E-03	**6.17E-04**
Phosphorus[e]	9.46E-06	6.90E-05	3.02E-04	6.90E-05
Silver[e]				
Selenium[e]	6.83E-07	4.98E-06	2.18E-05	4.98E-06
Thallium[e]				
Vanadium[e]	3.18E-05	2.32E-04	1.02E-03	2.32E-04
Zinc[e]	2.91E-05	2.12E-04	9.30E-04	2.12E-04

a) Emission factors for criteria pollutants are from AP-42, 1.3, Fuel Oil Combustion, 9/98; all other factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
b) AP-42, Table 1.3-1, Criteria Pollutant Emission Factors for Fuel Oil Combustion, 9/98, Boilers < 100 MMBtu, SOx based on max fuel sulfur content, PM10 is 1.3 lb/1,000 gal + 50% of 2.0 lb/1,000 g
c) AP-42, Table 11.1-13, Emission Factors for Hot Mix Asphalt Hot Oil Systems, 3/04
d) AP-42, Table 1.3-3, Emission Factors for Total Organic Compounds (TOC), Methane, and Nonmethane TOC (NMTOC) from Uncontrolled Distillate Fuel Oil Combustion; Commercial Boiler
e) IDAPA Toxic Air Pollutant
f) AP-42, Table 1.3-11, Emission Factors for Metals from Uncontrolled No. 6 Fuel Oil Combustion

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

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Asphalt Tank Heater - Natural Gas Fired, Estimated Emissions Using AP-42 Section 11.1 (Hot Mix Asphalt Plants)

Fuel Type Toggle =	1	
Fuel Consumption Rate	980	scf/hr
Max Daily Operation	24	hr/day
Max Annual Operation	8,760	hrs/yr

Note: CO EF per AP-42 Table 1.4.1 for natural gas combustion in boilers is 84 lb/MMscf, a factor of 10 higher than the factor shown in Table 11.1-13
Tank heater CO emissions are based on using 84 lb/MMscf

Pollutant	Emission Factor[a] (lb/scf)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total)				
PM-10 (total)				
PM-2.5				
CO [c]	**8.90E-06**	8.73E-03	3.82E-02	
NOx				
SO_2				
VOC				
Lead				
HCl [e]				
Dioxins[e]				
-- No EFs for Natural Gas Fuel --				
Furans[e]				
-- No EFs for Natural Gas Fuel --				
Non-PAH HAPs				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]				
1,3-Butadiene[e]				
Ethylbenzene[e]				
Formaldehyde[c,e]	2.60E-08	2.55E-05	1.12E-04	**2.55E-05**
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[e]				
Xylene[e]				
POM (7-PAH Group)		0.00E+00		**0.00E+00**

Pollutant	Emission Factor[a] (lb/scf)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs				
2-Methylnaphthalene				
3-Methylchloranthrene[e]				
Acenaphthene				
Acenaphthylene				
Anthracene				
Benzo(a)anthracene				
Benzo(a)pyrene[e]				
Benzo(b)fluoranthene				
Benzo(e)pyrene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Chrysene				
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene				
Fluorene				
Indeno(1,2,3-cd)pyrene				
Naphthalene[e]				
Perylene				
Phenanthrene				
Pyrene				
Non-HAPs Organic Compounds				
Acetone[e]				
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals				
Antimony[e]				
Arsenic[e]				
Barium[e]				
Beryllium[e]				
Cadmium[e]				
Chromium[e]				
Cobalt[e]				
Copper[e]				
Hexavalent Chromium[e]				
Manganese[e]				
Mercury[e]				
Molybdenum[e]				
Nickel[e]				
Phosphorus[e]				
Silver[e]				
Selenium[e]				
Thallium[e]				
Vanadium[e]				
Zinc[e]				

a) Emission factors are from AP-42
b) (reserved)
c) AP-42, Table 11.1-13, Emission Factors for Hot Mix Asphalt Hot Oil Systems, 3/04
d) (reserved)
e) IDAPA Toxic Air Pollutant

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

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Asphalt Tank Heater - Natural Gas Fired, Estimated Emissions Using AP-42 Section 1.4 (Natural Gas Combustion)

Fuel Type Toggle =	1	
Fuel Consumption Rate	980	scf/hr
Max Daily Operation	24	hr/day
Max Annual Operation	8,760	hrs/yr
Heating Value Correction:	1.000	applied to Emissions (lb/hr, T/yr) calculations

Note: CO EF per AP-42 Table 1.4.1 for natural gas combustion in boilers is 84 lb/MMscf, a factor of 10 higher than the factor shown in Table 11.1-13
Tank heater CO emissions are based on using 84 lb/MMscf

Pollutant	Emission Factor[a] (lb/MMscf)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total)[c]	7.6	7.45E-03	3.26E-02	
PM-10 (total)[c]	7.6	7.45E-03	3.26E-02	
PM-2.5	7.6	7.45E-03	3.26E-02	
CO[b]	**84**	8.24E-02	3.61E-01	
NOx[b]	100	9.80E-02	4.29E-01	
SO_2[c]	0.6	5.88E-04	2.58E-03	
VOC[c]	5.5	5.39E-03	2.36E-02	
Lead[c]	5.00E-04	4.90E-07	2.15E-06	
HCl[e]				
Dioxins[e]				
-- No EFs for Natural Gas Fuel --				
Furans[e]				
-- No EFs for Natural Gas Fuel --				
Non-PAH HAPs[f]				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[c1, e]	2.10E-03	2.06E-06	9.02E-06	**2.06E-06**
1,3-Butadiene[e]				
Ethylbenzene[e]				
Formaldehyde[e]	7.50E-02	7.35E-05	3.22E-04	**7.35E-05**
Hexane[e]	1.80E+00	1.76E-03	7.73E-03	1.76E-03
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[c1, e]	2.60E+00	2.55E-03	1.12E-02	2.55E-03
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[c1, e]	3.40E-03	3.33E-06	1.46E-05	3.33E-06
Xylene[e]				
POM (7-PAH Group)		1.12E-08		**1.12E-08**

Pollutant	Emission Factor[a] (lb/MMscf)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene[c1]	2.40E-05	2.35E-08	1.03E-07	**2.35E-08**
3-Methylchloranthrene[c1, e]	1.80E-06	1.76E-09	7.73E-09	**1.76E-09**
Acenaphthene[c1]	1.80E-06	1.76E-09	7.73E-09	**1.76E-09**
Acenaphthylene[c1]	1.80E-06	1.76E-09	7.73E-09	**1.76E-09**
Anthracene[c1]	2.40E-06	2.35E-09	1.03E-08	**2.35E-09**
Benzo(a)anthracene[c1]	1.80E-06	1.76E-09	7.73E-09	**1.76E-09**
Benzo(a)pyrene[c1, e]	1.20E-06	1.18E-09	5.15E-09	**1.18E-09**
Benzo(b)fluoranthenec[1]	1.80E-06	1.76E-09	7.73E-09	**1.76E-09**
Benzo(e)pyrene				
Benzo(g,h,l)perylene[c1]	1.20E-06	1.18E-09	5.15E-09	**1.18E-09**
Benzo(k)fluoranthene[c1]	1.80E-06	1.76E-09	7.73E-09	**1.76E-09**
Chrysene[c1]	1.80E-06	1.76E-09	7.73E-09	**1.76E-09**
Dibenzo(a,h)anthracene[c1]	1.20E-06	1.18E-09	5.15E-09	**1.18E-09**
Dichlorobenzene[c1]	1.20E-03	1.18E-06	5.15E-06	**1.18E-06**
Fluoranthene[c1]	3.00E-06	2.94E-09	1.29E-08	**2.94E-09**
Fluorene[c1]	2.80E-06	2.75E-09	1.20E-08	**2.75E-09**
Indeno(1,2,3-cd)pyrene[c1]	1.80E-06	1.76E-09	7.73E-09	**1.76E-09**
Naphthalene[c1, e]	6.10E-04	5.98E-07	2.62E-06	**5.98E-07**
Perylene				
Phenanthrene[c1]	1.70E-05	1.67E-08	7.30E-08	**1.67E-08**
Pyrene[c1]	5.00E-06	4.90E-09	2.15E-08	**4.90E-09**
Non-HAPs Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane[c1]	2.10E+00	2.06E-03	9.02E-03	2.06E-03
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals[g]				
Antimony[e]				
Arsenic[d,e]	2.00E-04	1.96E-07	8.59E-07	**1.96E-07**
Barium[d,e]	4.40E-03	4.31E-06	1.89E-05	4.31E-06
Beryllium[e]	1.20E-05	1.18E-08	5.15E-08	**1.18E-08**
Cadmium[d,e]	1.10E-03	1.08E-06	4.72E-06	**1.08E-06**
Chromium[d,e]	1.40E-03	1.37E-06	6.01E-06	1.37E-06
Cobalt[d,e]	8.40E-05	8.24E-08	3.61E-07	8.24E-08
Copper[d,e]	8.50E-04	8.33E-07	3.65E-06	8.33E-07
Hexavalent Chromium[e]				
Manganese[d,e]				
Mercury[d,e]				
Molybdenum[d,e]	1.10E-03	1.08E-06	4.72E-06	1.08E-06
Nickel[d,e]				
Phosphorus[e]				
Silver[e]				
Selenium[d,e]				
Thallium[e]				
Vanadium[d,e]	2.30E-03	2.25E-06	9.88E-06	2.25E-06
Zinc[d,e]				

a) Emission factors are from AP-42
b) AP-42, Table 1.4-1, Emission Factors for NOx and CO from Natural Gas Combustion, 7/98
c) AP-42, Table 1.4-2, Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion, 7/98
c1) AP-42, Table 1.4-3, Emission Factors for Speciated Organic Compounds from Natural Gas Combustion, 7/98
d) AP-42, Table 1.4-4, Emission Factors for Metals from Natural Gas Combustion, 7/98
e) IDAPA Toxic Air Pollutant

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

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Silo Filling Operations AP-42 Section 11.1

Emissions Toggle =	1	
Max Hourly Production	300	T/hr
Max Daily Production	5,000	Tons/day
Max Annual Production	300,000	Tons/yr

Pollutant	Emission Factor[a] Silo Fill (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total)[b]	5.86E-04	0.1758	0.0879	
PM-10 (total)[b]	5.86E-04	0.1758	0.0879	
PM-2.5[b]	5.86E-04	0.1758	0.0879	
CO[b]	1.18E-03	0.3540	0.1770	
NOx				
SO_2				
VOC[f,g]	1.22E-04	3.66E-02	0.0183	
Lead				
HCl[f]	No Data			
Dioxins[e]				
2,3,7,8-TCDD				
Total TCDD				
1,2,3,7,8-PeCDD				
Total PeCDD				
1,2,3,4,7,8-HxCDD				
1,2,3,6,7,8-HxCDD				
1,2,3,7,8,9-HxCDD				
Total HxCDD				
1,2,3,4,6,7,8-Hp-CDD				
Total HpCDD				
Octa CDD				
Total PCDD[h]				
Furans[e]				
2,3,7,8-TCDF				
Total TCDF				
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF				
1,2,3,4,7,8-HxCDF				
1,2,3,6,7,8-HxCDF				
2,3,4,6,7,8-HxCDF				
1,2,3,7,8,9-HxCDF				
Total HxCDF				
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF				
Octa CDF				
Total PCDF[h]				
Total PCDD/PCDF[h]				
Non-PAH HAPs				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]	3.90E-06	1.17E-03	5.85E-04	0.0001
1,3-Butadiene[e]				
Ethylbenzene[e]	4.63E-06	1.39E-03	6.95E-04	9.65E-04
Formaldehyde[e]	8.41E-05	2.52E-02	1.26E-02	0.0029
Hexane[e]	1.22E-05	3.66E-03	1.83E-03	2.54E-03
Isooctane	3.78E-08	1.13E-05	5.67E-06	7.87E-06
Methyl Ethyl Ketone[e]	4.75E-06	1.43E-03	7.13E-04	9.90E-04
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]		0.00E+00	0.00E+00	
Toluene[e]	7.56E-06	2.27E-03	1.13E-03	1.57E-03
Xylene[e]	3.13E-05	9.40E-03	4.70E-03	6.52E-03
POM (7-PAH Group)		2.03E-04		2.31E-05

Pollutant	Emission Factor[a] Silo Fill (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene	1.34E-05	4.01E-03	2.01E-03	4.55E-04
3-Methylchloranthrene[e]				
Acenaphthene	1.19E-06	3.56E-04	1.78E-04	4.09E-05
Acenaphthylene	3.55E-08	1.07E-05	5.33E-06	1.22E-06
Anthracene	3.30E-07	9.90E-05	4.95E-05	1.13E-05
Benzo(a)anthracene	1.42E-07	4.27E-05	2.13E-05	4.87E-06
Benzo(a)pyrene[e]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(e)pyrene	2.41E-08	7.24E-06	3.62E-06	8.26E-07
Benzo(g,h,i)perylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	5.33E-07	1.60E-04	8.00E-05	1.83E-05
Dibenzo(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dichlorobenzene				
Fluoranthene	3.81E-07	1.14E-04	5.71E-05	1.30E-05
Fluorene	2.56E-06	7.69E-04	3.65E-04	8.78E-05
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene[e]	4.62E-06	1.39E-03	6.93E-04	1.58E-04
Perylene	7.62E-08	2.29E-05	1.14E-05	2.61E-06
Phenanthrene	4.57E-06	1.37E-03	6.86E-04	1.57E-04
Pyrene	1.12E-06	3.35E-04	1.68E-04	3.83E-05
Non-HAP Organic Compounds				
Acetone[f]	6.70E-06	2.01E-03	0.0010	1.40E-03
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	1.34E-04	4.02E-02	0.0201	2.79E-02
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals				
Antimony[e]				
Arsenic[e]				
Barium[e]				
Beryllium[e]				
Cadmium[e]				
Chromium[e]				
Cobalt[e]				
Copper[e]				
Hexavalent Chromium[e]				
Manganese[e]				
Mercury[e]				
Molybdenum[e]				
Nickel[e]				
Phosphorus[e]				
Silver[e]				
Selenium[e]				
Thallium[e]				
Vanadium[e]				
Zinc[e]				

a) Emission factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
b) AP-42, Table 11.1-14, Predictive Emission Factor Equations for Load-Out and Silo Filling Operations, 3/04 Defaults: (-V) = 0.5 T (°F) = 325

		LOADOUT	SILO FILL	
Total PM EF = $0.000181+0.00141(-V)e^{((0.0251)(T+460)-20.43)}$ + $000332+0.00105(-V)e^{((0.0251)(T+460)-20.4}$	=	5.219E-04	5.859E-04	(split addends)
Organic PM EF = $0.00141(-V)e^{((0.0251)(T+460)-20.43)}$ + $0.00105(-V)e^{((0.0251)(T+460)-20.43)}$	=	3.409E-04	2.539E-04	(split addends)
TOC PM EF = $0.0172(-V)e^{((0.0251)(T+460)-20.43)}$ + $0.0504(-V)e^{((0.0251)(T+460)-20.43)}$	=	4.159E-03	1.219E-02	(split addends)
CO PM EF = $0.00558(-V)e^{((0.0251)(T+460)-20.43)}$ + $0.00488(-V)e^{((0.0251)(T+460)-20.43)}$	=	1.349E-03	1.180E-03	(split addends)

e) IDAPA Toxic Air Pollutant
f) AP-42, Table 11.1-15, Speciation Profiles for Load-out, Silo Filling, & Asphalt Storage--Organic Particulate-Based Compounds, 3/04 (EF=Spec% * Organic PM EF)
g) AP-42, Table 11.1-16, Speciation Profiles for Load-out, Silo Filling, & Asphalt Storage--Organic Volatile-Based Compounds, 3/04, (EF=Spec% * TOC PM EF)

Pollutants shown in bold text are carcinogens subject to an annual standard. These lb/hr values are annual averages.
Pollutants shown in blue text are organic volatile-based compounds, EF = Spec% x TOC PM EF.

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Silo Filling Operations AP-42 Section 11.1, Page 2

Fuel Type Toggle =	1	
Max Hourly Production	300	T/hr
Max Daily Production	5,000	Tons/day
Max Annual Production	300,000	Tons/yr

Pollutant	Emission Factor[a] Silo Fill (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
non-PAH HAPs[g]				
Bromomethane[e]	5.97E-07	1.79E-04	0.0001	1.24E-04
2-Butanone (see Methyl Ethyl Ketone)				
Carbon disulfide[e]	1.95E-06	5.85E-04	0.0003	4.06E-04
Chloroethane (Ethyl chloride[e])	4.87E-07	1.46E-04	0.0001	1.02E-04
Chloromethane (Methyl chloride[e])	2.80E-06	8.41E-04	0.0004	5.84E-04
Cumene[e]				
n-Hexane (see Hexane[e])				
Methylene chloride (Dichloromethane[e])	3.29E-08	9.87E-06	4.94E-06	6.86E-06
MTBE				
Styrene[e]	6.55E-07	1.97E-04	9.87E-05	1.37E-04
Tetrachloroethane (Tetrachloroethylene[e])	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,1-Trichloroethane (Methyl chloroform[e])	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trichloroethene (Trichloroethylene[e])				
Trichlorofluoromethane				
m-/p-Xylene[e] (added into Xylene[e])	2.44E-05	7.31E-03	0.0037	5.08E-03
o-Xylene[e] (added into Xylene[e])	6.95E-06	2.08E-03	0.0010	1.45E-03
Phenol[e,f]				
Non-HAP Organic Compounds				
Methane	3.17E-03	9.51E-01	0.4753	6.60E-01

Pollutants shown in blue text are organic volatile-based compounds, EF = Spec% x TOC PM EF.

Facility: STAKER PARSON COMPANIES dba IDAHO MATERIALS AND CONSTRUCTION
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Load-out Operations AP-42 Section 11.1

Emissions Toggle = 1
Max Hourly Production 300 T/hr
Max Daily Production 5,000 Tons/day
Max Annual Production 300,000 Tons/yr

Pollutant	Emission Factor[a] Loadout (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total)[b]	5.22E-04	0.157	0.08	
PM-10 (total)[b]	5.22E-04	0.157	0.08	
PM-2.5[b]	5.22E-04	0.157	0.08	
CO[b]	1.35E-03	0.405	0.20	
NOx				
SO_2				
VOC[b,g]	3.91E-03	1.173	0.59	
Lead				
HCl[d,e]	No Data			
Dioxins[e]				
2,3,7,8-TCDD				
Total TCDD				
1,2,3,7,8-PeCDD				
Total PeCDD				
1,2,3,4,7,8-HxCDD				
1,2,3,6,7,8-HxCDD				
1,2,3,7,8,9-HxCDD				
Total HxCDD				
1,2,3,4,6,7,8-Hp-CDD				
Total HpCDD				
Octa CDD				
Total PCDD[e]				
Furans[e]				
2,3,7,8-TCDF				
Total TCDF				
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF				
1,2,3,4,7,8-HxCDF				
1,2,3,6,7,8-HxCDF				
2,3,4,6,7,8-HxCDF				
1,2,3,7,8,9-HxCDF				
Total HxCDF				
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF				
Octa CDF				
Total PCDF[e]				
Total PCDD/PCDF[e]				
Non-PAH HAPs				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]	2.16E-06	6.49E-04	3.24E-04	7.41E-05
1,3-Butadiene[e]				
Ethylbenzene[e]	1.16E-05	3.49E-03	1.75E-03	2.43E-03
Formaldehyde[e]	3.65E-06	1.10E-03	5.49E-04	1.25E-04
Hexane[e]	6.24E-06	1.87E-03	9.36E-04	1.30E-03
Isooctane	7.49E-08	2.25E-05	1.12E-05	1.56E-05
Methyl Ethyl Ketone[e]	2.04E-06	6.11E-04	3.06E-04	4.25E-04
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[e]	8.73E-06	2.62E-03	1.31E-03	1.82E-03
Xylene[e]	5.03E-05	1.51E-02	7.55E-03	1.05E-02
POM (7-PAH Group)		1.35E-04		1.56E-05

Pollutant	Emission Factor[a] Loadout (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene	8.11E-06	2.43E-03	1.22E-03	2.78E-04
3-Methylchloranthrene[e]				
Acenaphthene	8.86E-07	2.66E-04	1.33E-04	3.04E-05
Acenaphthylene	9.55E-08	2.86E-05	1.43E-05	3.27E-06
Anthracene	2.38E-07	7.16E-05	3.58E-05	8.17E-06
Benzo(a)anthracene	6.48E-08	1.94E-05	9.72E-06	2.22E-06
Benzo(a)pyrene[e]	7.84E-09	2.35E-06	1.18E-06	2.69E-07
Benzo(b)fluoranthene	2.59E-08	7.77E-06	3.89E-06	8.87E-07
Benzo(e)pyrene	2.65E-08	7.95E-06	3.98E-06	9.11E-07
Benzo(g,h,i)perylene	6.48E-09	1.94E-06	9.72E-07	2.22E-07
Benzo(k)fluoranthene	7.50E-09	2.25E-06	1.13E-06	2.57E-07
Chrysene	3.51E-07	1.05E-04	5.27E-05	1.20E-05
Dibenzo(a,h)anthracene	1.26E-09	3.78E-07	1.89E-07	4.32E-08
Dichlorobenzene				
Fluoranthene	1.70E-07	5.11E-05	2.56E-05	5.84E-06
Fluorene	2.63E-06	7.88E-04	3.94E-04	8.93E-05
Indeno(1,2,3-cd)pyrene	1.60E-09	4.81E-07	2.40E-07	5.49E-08
Naphthalene[e]	4.25E-06	1.28E-03	6.38E-04	1.46E-04
Perylene	7.50E-08	2.25E-05	1.13E-05	2.57E-06
Phenanthrene	2.76E-06	8.28E-04	4.14E-04	9.46E-05
Pyrene	5.11E-07	1.53E-04	7.67E-05	1.75E-05
Non-HAP Organic Compounds				
Acetone[f]	1.95E-06	5.84E-04	2.92E-04	4.06E-04
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[f]				
Ethylene	2.95E-05	8.86E-03	4.43E-03	6.15E-03
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals				
Antimony[f]				
Arsenic[e]				
Barium[f]				
Beryllium[e]				
Cadmium[e]				
Chromium[f]				
Cobalt[f]				
Copper[f]				
Hexavalent Chromium[e]				
Manganese[f]				
Mercury[f]				
Molybdenum[f]				
Nickel[e]				
Phosphorus[e]				
Silver[f]				
Selenium[f]				
Thallium[f]				
Vanadium[f]				
Zinc[f]				

a) Emission factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
b) AP-42, Table 11.1-14, Predictive Emission Factor Equations for Load-Out and Silo Filling Operations, 3/04 — Defaults: (-V) = 0.5 T(°F) = 325

		LOADOUT	SILO FILL	
$\text{Total PM EF} = 0.000181+0.00141(-V)e^{((0.0251)(T+460)-20.43)} + 000332+ 0.00105(-V)e^{((0.0251)(T+460)-2}$	=	5.219E-04	5.859E-04	(split addends)
$\text{Organic PM EF} = 0.00141(-V)e^{((0.0251)(T+460)-20.43)} + 0.00105(-V)e^{((0.0251)(T+460)-20.43)}$	=	3.409E-04	2.539E-04	(split addends)
$\text{TOC PM EF} = 0.0172(-V)e^{((0.0251)(T+460)-20.43)} + 0.0504(-V)e^{((0.0251)(T+460)-20.43)}$	=	4.159E-03	1.219E-02	(split addends)
$\text{CO PM EF} = 0.00558(-V)e^{((0.0251)(T+460)-20.43)} + 0.00488(-V)e^{((0.0251)(T+460)-20.43)}$	=	1.349E-03	1.180E-03	(split addends)

e) IDAPA Toxic Air Pollutant
f) AP-42, Table 11.1-15, Speciation Profiles for Load-out, Silo Filling, & Asphalt Storage--Organic Particulate-Based Compounds, 3/04 (EF=Spec% * Organic PM EF)
g) AP-42, Table 11.1-16, Speciation Profiles for Load-out, Silo Filling &Asphalt Storage--Organic Volatile-Based Compounds, 3/04, (EF=Spec% * TOC PM EF)

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Pollutants shown in blue text are organic volatile-based compounds, EF = Spec% x TOC PM EF.

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Load-out Operations AP-42 Section 11.1, Page 2

Fuel Type Toggle = 1
Max Hourly Production 300 T/hr
Max Daily Production 5,000 Tons/day
Max Annual Production 300,000 Tons/yr

Pollutant	Emission Factor[a] Loadout (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
non-PAH HAPs[g]				
Bromomethane[e]	3.99E-07	1.20E-04	5.99E-05	8.32E-05
2-Butanone (see Methyl Ethyl Ketone)				
Carbon disulfide[e]	5.41E-07	1.62E-04	8.11E-05	1.13E-04
Chloroethane (Ethyl chloride[e])	8.73E-09	2.62E-06	1.31E-06	1.82E-06
Chloromethane (Methyl chloride[e])	6.24E-07	1.87E-04	9.36E-05	1.30E-04
Cumene[e]	4.57E-06	1.37E-03	6.86E-04	9.53E-04
n-Hexane (see Hexane[e])				
Methylene chloride (Dichloromethane[e])				
MTBE				
Styrene[e]	3.04E-07	9.11E-05	4.55E-05	6.33E-05
Tetrachloroethene (Tetrachloroethylene[e])	3.20E-07	9.61E-05	4.80E-05	6.67E-05
1,1,1-Trichloroethane (Methyl chloroform[e])				
Trichloroethene (Trichloroethylene[e])				
Trichlorofluoromethane	5.41E-08	1.62E-05	8.11E-06	1.13E-05
m-/p-Xylene[e] (added into Xylene[e])	1.71E-05	5.12E-03	2.56E-03	3.55E-03
o-Xylene[e] (added into Xylene[e])	3.33E-05	9.98E-03	4.99E-03	6.93E-03
Phenol[f]	4.02E-06	1.21E-03	6.03E-04	8.38E-04
Non-HAP Organic Compounds				
Methane	2.70E-04	8.11E-02	4.05E-02	5.63E-02

Pollutants shown in blue text are organic volatile-based compounds, EF = Spec% x TOC PM EF.

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Facility: STAKER PARSON COMPANIES dba IDAHO MATERIALS AND CONSTRUCTION
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G1 Electrical Generator < 600 hp (447 kW)

Fuel Type Toggle =	1	
Fuel Consumption Rate	0.00	gal/hr
Calculated MMBtu/hr	0.000	MMBtu/hr
Max Daily Operation	0	hr/day
Max Annual Operation	0	hrs/yr

Rated Power (kW):	0
Not EPA Certified:	Yes
Certified EPA Tier 1:	No
Certified EPA Tier 2:	No
Certified EPA Tier 3:	No
Blue Sky Engine:	No

Conversion Factors:

Avg brake-specific fuel consumption (BSFC) =	7000	Btu/hp-hr
1 hp =	0.746	kW
1 lb =	453.592	g

g/kW-hr x (lb/453g) x (hp-hr/7000 Btu) x (0.746 kW/hp) x 10^6 Btu/MMBtu = lb/MMBtu
g/kW-hr x 0.23486 = lb/MMBtu

Pollutant:	NOx	VOC (total TOC--> VOCs)		CO	PM = PM10
EMISSION FACTORS USED FOR G1 (lb/MMBtu):	**4.41**	**0.36**		**0.95**	**0.310**

AP-42, Ch 3.3 (10/96) EMISSION FACTORS (diesel fueled)

Pollutant:	NOx	VOC (total TOC--> VOCs)		CO	PM = PM10
Emission Factor (lb/MMBtu)	4.41	0.36		0.95	0.31
Emission Factor (g/kW-hr))	18.78	1.53		4.05	1.32

40 CFR 89 and 1039 (updated for <37 kW only), EPA CERTIFIED GENERATOR EMISSION FACTORS (g/kW-hr converted to lb/MMBtu)

Rated Power (kW)	Tier	Applicable?	Model Year[1]	NOx	HC	NMHC + NOx	CO	PM = PM10
kW< 8	1	0	2000	---	*0.36*	2.47	1.88	0.23
kW< 8	2	0	2005	---	*0.36*	1.76	1.88	0.19
kW < 8	4	0	2008	---	---	1.76	1.88	0.09
kW< 8	BlueSky	0	n/a	---	*0.36*	1.08	*1.88*	0.11
8 ≤ kW < 19	1	0	2000	---	*0.36*	2.23	1.55	0.19
8 ≤ kW < 19	2	0	2005	---	*0.36*	1.76	1.55	0.19
8 ≤ kW < 19	4	0	2008	---	---	1.76	1.55	0.19
8 ≤ kW < 19	BlueSky	0	n/a	---	*0.36*	1.06	*1.55*	0.11
19 ≤ kW < 37	1	0	1999	---	*0.36*	2.23	1.29	0.19
19 ≤ kW < 37	2	0	2004	---	*0.36*	1.76	1.29	0,14
19 ≤ kW < 37	4	0	2008	---	---	1.76	1.29	0.07
19 ≤ kW < 37	BlueSky	0	n/a	---	*0.36*	1.06	*1.29*	0.08
37 ≤ kW < 75	1	0	1998	2.16	*0.36*	---	*1.17*	*0.31*
37 ≤ kW < 75	2	0	2004	---	*0.36*	1.76	1.17	0.09
37 ≤ kW < 75	3	0	2008	---	*0.36*	1.10	1.17	0.09
37 ≤ kW < 75	BlueSky	0	n/a	---	*0.36*	1.10	*1.17*	0.06
75 ≤ kW < 130	1	0	1997	2.16	*0.36*	---	*1.17*	*0.31*
75 ≤ kW < 130	2	0	2003	---	*0.36*	1.55	1.17	0.07
75 ≤ kW < 130	3	0	2007	---	*0.36*	0.94	1.17	0.07
75 ≤ kW < 130	BlueSky	0	n/a	---	*0.36*	0.94	*1.17*	0.04
130 ≤ kW < 225	1	0	1996	2.16	0.31	---	2.68	0.13
130 ≤ kW < 225	2	0	2003	---	*0.31*	1.55	0.82	0.05
130 ≤ kW < 225	3	0	2006	---	*0.31*	0.94	0.82	0.05
130 ≤ kW ≤ 560	BlueSky	0	n/a	---	*0.31*	0.94	*0.82*	0.03
225 ≤ kW < 450	1	0	1996	2.16	0.31	---	2.68	0.13
225 ≤ kW < 450	2	0	2001	---	*0.31*	1.50	0.82	0.05
225 ≤ kW < 450	3	0	2006	---	*0.31*	0.94	0.82	0.05
450 ≤ kW < 560	1	0	1996	2.16	0.31	---	2.68	0.13
450 ≤ kW < 560	2	0	2002	---	*0.31*	1.50	0.82	0.05
450 ≤ kW < 560	3	0	2006	---	*0.31*	0.94	0.82	0.05
kW > 560	1	0	2000	2.16	0.31	---	2.68	0.13
kW > 560	2	0	2006	---	*0.31*	1.50	0.82	0.05
kW > 560	BlueSky	0	n/a	---	*0.31*	0.89	*0.82*	0.03

40 CFR 89 and 1039 (updated for <37 kW only), EPA CERTIFIED GENERATOR EMISSION FACTORS (g/kW-hr converted to lb/MMBtu)

Rated Power (kW)	Tier	Applicable?	Model Year[1]	NOx	HC	NMHC + NOx	CO	PM (= PM10)
kW< 8	1	0	2000	0.00	0.00	0.00	0.00	0.00
kW< 8	2	0	2005	0.00	0.00	0.00	0.00	0.00
kW< 8	4	0	2008	0.00	---	0.00	0.00	0.00
kW< 8	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
8 ≤ kW < 19	1	0	2000	0.00	0.00	0.00	0.00	0.00
8 ≤ kW < 19	2	0	2005	0.00	0.00	0.00	0.00	0.00
8 ≤ kW < 19	4	0	2008	0.00	0.00	0.00	0.00	0.00
8 ≤ kW < 19	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
19 ≤ kW < 37	1	0	1999	0.00	0.00	0.00	0.00	0.00
19 ≤ kW < 37	2	0	2004	0.00	0.00	0.00	0.00	0.00
19 ≤ kW < 37	4	0	2008	0.00	---	0.00	0.00	0.00
19 ≤ kW < 37	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 75	1	0	1998	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 75	2	0	2004	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 75	3	0	2008	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 75	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
75 ≤ kW < 130	1	0	1997	0.00	0.00	0.00	0.00	0.00
75 ≤ kW < 130	2	0	2003	0.00	0.00	0.00	0.00	0.00
75 ≤ kW < 130	3	0	2007	0.00	0.00	0.00	0.00	0.00
75 ≤ kW < 130	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
130 ≤ kW < 225	1	0	1996	0.00	0.00	0.00	0.00	0.00
130 ≤ kW < 225	2	0	2003	0.00	0.00	0.00	0.00	0.00
130 ≤ kW < 225	3	0	2006	0.00	0.00	0.00	0.00	0.00
130 ≤ kW ≤ 560	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
225 ≤ kW < 450	1	0	1996	0.00	0.00	0.00	0.00	0.00
225 ≤ kW < 450	2	0	2001	0.00	0.00	0.00	0.00	0.00
225 ≤ kW < 450	3	0	2006	0.00	0.00	0.00	0.00	0.00
450 ≤ kW < 560	1	0	1996	0.00	0.00	0.00	0.00	0.00
450 ≤ kW < 560	2	0	2002	0.00	0.00	0.00	0.00	0.00
450 ≤ kW < 560	3	0	2006	0.00	0.00	0.00	0.00	0.00
kW > 560	1	0	2000	0.00	0.00	0.00	0.00	0.00
kW > 560	2	0	2006	0.00	0.00	0.00	0.00	0.00
kW > 560	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
EMISSION FACTORS FOR GENERATOR G1 (lb/MMBTU):				**0.00**	**0.00**	**0.00**	**0.00**	**0.000**

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IC Engine 1 Powering an Electrical Generator < 600 hp (447 kW) AP-42 Section 3.3 (diesel fueled)

Fuel Type Toggle =	1	0 kw	User Input Weight % Sulfur = 0.0015%
Fuel Consumption Rate	0.00 gal/hr		AP-42 3.3 SO2 EF = 0.29 for #2 fuel oil, presumed max 0.5%
Calculated MMBtu/hr	0.000 MMBtu/hr		SO2 emissions are multiplied by a factor: User Input Value/0.5% = 0.00
Max Daily Operation	0 hr/day		Not an EPA-Certified Generator
Max Annual Operation	0 hrs/yr		

Pollutant	Emission Factor[a] (lb/MMBtu)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total)[b]	0.31	0.000	0.00E+00	
PM-10 (total)[b]	0.31	0.000	0.00E+00	
PM-2.5	0.07	0.000	0.00E+00	
CO[b]	0.95	0.000	0.00E+00	
NOx[b]	4.41	0.000	0.00E+00	
SO_2[b] (total SOx presumed SO2)	0.29	0.00E+00	0.00E+00	
VOC[b] (total TOC--> VOCs)	0.36	0.000	0.00E+00	
Lead				
HCl[e]				
Dioxins[e]				
2,3,7,8-TCDD				
Total TCDD				
1,2,3,7,8-PeCDD				
Total PeCDD				
1,2,3,4,7,8-HxCDD[c]				
1,2,3,6,7,8-HxCDD				
1,2,3,7,8,9-HxCDD[c]				
Total HxCDD				
1,2,3,4,6,7,8-Hp-CDD[c]				
Total HpCDD[c]				
Octa CDD[c]				
Total PCDD[c]				
Furans[e]				
2,3,7,8-TCDF				
Total TCDF[c]				
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF[c]				
1,2,3,4,7,8-HxCDF				
1,2,3,6,7,8-HxCDF				
2,3,4,6,7,8-HxCDF				
1,2,3,7,8,9-HxCDF				
Total HxCDF[c]				
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF[c]				
Octa CDF[c]				
Total PCDF[c]				
Total PCDD/PCDF[c]				
Non-PAH HAPs				
Acetaldehyde[c]	7.67E-04	0.00E+00	0.00E+00	**0.00E+00**
Acrolein[c]	9.25E-05	0.00E+00	0.00E+00	0.00E+00
Benzene[c,e]	9.33E-04	0.00E+00	0.00E+00	**0.00E+00**
1,3-Butadiene[c,e]	3.91E-05	0.00E+00	0.00E+00	**0.00E+00**
Ethylbenzene[e]				
Formaldehyde[c,e]	1.18E-03	0.00E+00	0.00E+00	**0.00E+00**
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[c,e]	4.09E-04	0.00E+00	0.00E+00	0.00E+00
Xylene[c,e]	2.85E-04	0.00E+00	0.00E+00	0.00E+00
POM (7-PAH Group)		0.00E+00		**0.00E+00**

Pollutant	Emission Factor[a] (lb/MMBtu)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs				
2-Methylnaphthalene				
3-Methylchloranthrene[e]				
Acenaphthene[c]	1.42E-06	0.00E+00	0.00E+00	**0.00E+00**
Acenaphthylene[c]	5.06E-06	0.00E+00	0.00E+00	**0.00E+00**
Anthracene[c]	1.87E-06	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)anthracene[c]	1.68E-06	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)pyrene[c,e]	1.88E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(b)fluoranthene[c]	9.91E-08	0.00E+00	0.00E+00	**0.00E+00**
Benzo(e)pyrene				
Benzo(g,h,l)perylene[c]	4.89E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(k)fluoranthene[c]	1.55E-07	0.00E+00	0.00E+00	**0.00E+00**
Chrysene[c]	3.53E-07	0.00E+00	0.00E+00	**0.00E+00**
Dibenzo(a,h)anthracene[c]	5.83E-07	0.00E+00	0.00E+00	**0.00E+00**
Dichlorobenzene				
Fluoranthene[c]	7.61E-06	0.00E+00	0.00E+00	**0.00E+00**
Fluorene[c]	2.92E-05	0.00E+00	0.00E+00	**0.00E+00**
Indeno(1,2,3-cd)pyrene[c]	3.75E-07	0.00E+00	0.00E+00	**0.00E+00**
Naphthalene[c,e]	8.48E-05	0.00E+00	0.00E+00	**0.00E+00**
Perylene				
Phenanthrene[c]	2.94E-05	0.00E+00	0.00E+00	**0.00E+00**
Pyrene[c]	4.78E-06	0.00E+00	0.00E+00	**0.00E+00**
Non-HAP Organic Compounds				
Acetone[e]				
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals				
Antimony[e]				
Arsenic[e]				
Barium[e]				
Beryllium[e]				
Cadmium[e]				
Chromium[e]				
Cobalt[e]				
Copper[e]				
Hexavalent Chromium[e]				
Manganese[e]				
Mercury[e]				
Molybdenum[e]				
Nickel[e]				
Phosphorus[e]				
Silver[e]				
Selenium[e]				
Thallium[e]				
Vanadium[e]				
Zinc[e]				

a) Emission factors are from AP-42
b) AP-42, Table 3.3-1, Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines, 10/96
c) AP-42, Table 3.3-2, Speciated Organic Compoun Emission Factors for Uncontrolled Diesel Engine, Emission Factor Rating E, 10/96
d) (reserved)
e) IDAPA Toxic Air Pollutant

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Facility:	**STAKER PARSON COMPANIES dba IDAHO MATERIALS AND CONSTRUCTION**		
5/25/2017 10:50	**Permit P-2017.0016**	**Facility ID: 083-00193**	
		ERROR - GENERATOR RATING IS LESS THAN 447 kW	

G2 Electrical Generator > 600 hp (447 kW)

Fuel Type Toggle =	1	
Fuel Consumption Rate	0.00	gal/hr
Calculated MMBtu/hr	0.00	MMBtu/hr
Max Daily Operation	0	hr/day
Max Annual Operation	0	hrs/yr

Rated Power (kW): 0

Not EPA Certified:	Yes
Certified EPA Tier 1:	No
Certified EPA Tier 2:	No
Certified EPA Tier 3:	No
Blue Sky Engine:	No

Conversion Factors:

Avg brake-specific fuel consumption (BSFC) =	7000	Btu/hp-hr
1 hp =	0.746	kW
1 lb =	453.592	g

g/kW-hr x (lb/453g) x (hp-hr/7000 Btu) x (0.746 kW/hp) x 10^6 Btu/MMBtu = lb/MMBtu

g/kW-hr x 0.23486 = lb/MMBtu

Pollutant:	NOx	VOC (total TOC--> VOCs)		CO	PM=PM10
EMISSION FACTORS USED FOR G2 (lb/MMBtu):	**3.20**	**0.09**		**0.85**	**0.130**

AP-42, Ch 3.4 (10/96) EMISSION FACTORS (diesel fueled, uncontrolled)

Pollutant:	NOx	VOC (total TOC--> VOCs)		CO	PM10
Emission Factor (lb/MMBtu)	3.2	0.09		0.85	0.13
Emission Factor (g/kW-hr))	13.63	0.38		3.62	0.55

Note: Rating for AP-42 PM10 EF of 0.0573 is "E" or Poor. Used Tier 1 PM EF and presumed PM = PM10

40 CFR 89, EPA CERTIFIED GENERATOR EMISSION FACTORS (g/kW-hr converted to lb/MMBtu)

Rated Power (kW)	Tier	Applicable?	Model Year[1]	NOx	HC	NMHC + NOx	CO	PM = PM10
kW< 8	1	0	2000	---	*0.36*	2.47	1.88	0.23
kW< 8	2	0	2005	---	*0.36*	1.76	1.88	0.19
kW< 8	BlueSky	0	n/a	---	*0.36*	1.08	*1.88*	0.11
8 ≤ kW < 19	1	0	2000	---	*0.36*	2.23	1.55	0.19
8 ≤ kW < 19	2	0	2005	---	*0.36*	1.76	1.55	0.19
8 ≤ kW < 19	BlueSky	0	n/a	---	*0.36*	1.06	*1.55*	0.11
19 ≤ kW < 37	1	0	1999	---	*0.36*	2.23	1.29	0.19
19 ≤ kW < 37	2	0	2004	---	*0.36*	1.76	1.29	0.14
19 ≤ kW < 37	BlueSky	0	n/a	---	*0.36*	1.06	*1.29*	0.085
37 ≤ kW < 75	1	0	1998	2.16	*0.36*	---	*0.95*	*0.31*
37 ≤ kW < 75	2	0	2004	---	*0.36*	1.76	1.17	0.09
37 ≤ kW < 75	3	0	2008	---	*0.36*	1.10	1.17	0.09
37 ≤ kW < 75	BlueSky	0	n/a	---	*0.36*	1.10	*1.17*	0.056
75 ≤ kW < 130	1	0	1997	2.16	*0.36*	---	*0.95*	*0.31*
75 ≤ kW < 130	2	0	2003	---	*0.36*	1.55	1.17	0.07
75 ≤ kW < 130	3	0	2007	---	*0.36*	0.94	1.17	0.07
75 ≤ kW < 130	BlueSky	0	n/a	---	*0.36*	0.94		0.042
130 ≤ kW < 225	1	0	1996	2.16	0.31	---	2.68	0.13
130 ≤ kW < 225	2	0	2003	---	*0.31*	1.55	0.82	0.05
130 ≤ kW < 225	3	0	2006	---	*0.31*	0.94	0.82	0.05
130 ≤ kW ≤ 560	BlueSky	0	n/a	---	*0.31*	0.94	*0.82*	0.028
225 ≤ kW < 450	1	0	1996	2.16	0.31	---	2.68	0.13
225 ≤ kW < 450	2	0	2001	---	*0.31*	1.50	0.82	0.05
225 ≤ kW < 450	3	0	2006	---	*0.31*	0.94	0.82	0.05
450 ≤ kW ≤ 560	1	0	1996	2.16	0.31	---	2.68	0.13
450 ≤ kW < 560	2	0	2002	---	*0.31*	1.50	0.82	0.05
450 ≤ kW ≤ 560	3	0	2006	---	*0.31*	0.94	0.82	0.05
kW > 560	1	0	2000	2.16	0.31	---	2.68	0.13
kW > 560	2	0	2006	---	*0.31*	1.50	0.82	0.05
kW > 560	BlueSky	0	n/a	---	*0.31*	0.89	*0.82*	0.028

40 CFR 89, EPA CERTIFIED GENERATOR EMISSION FACTORS FOR GENERATOR G1 (lb/MMBtu)

Rated Power (kW)	Tier	Applicable?	Model Year[1]	NOx	HC	NMHC + NOx	CO	PM10
kW< 8	1	0	2000	0.00	0.00	0.00	0.00	0.00
kW< 8	2	0	2005	0.00	0.00	0.00	0.00	0.00
kW< 8	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
8 ≤ kW < 19	1	0	2000	0.00	0.00	0.00	0.00	0.00
8 ≤ kW < 19	2	0	2005	0.00	0.00	0.00	0.00	0.00
8 ≤ kW < 19	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
19 ≤ kW < 37	1	0	1999	0.00	0.00	0.00	0.00	0.00
19 ≤ kW < 37	2	0	2004	0.00	0.00	0.00	0.00	0.00
19 ≤ kW < 37	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 75	1	0	1998	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 75	2	0	2004	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 75	3	0	2008	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 75	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
75 ≤ kW < 130	1	0	1997	0.00	0.00	0.00	0.00	0.00
75 ≤ kW < 130	2	0	2003	0.00	0.00	0.00	0.00	0.00
75 ≤ kW < 130	3	0	2007	0.00	0.00	0.00	0.00	0.00
75 ≤ kW < 130	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
130 ≤ kW < 225	1	0	1996	0.00	0.00	0.00	0.00	0.00
130 ≤ kW < 225	2	0	2003	0.00	0.00	0.00	0.00	0.00
130 ≤ kW < 225	3	0	2006	0.00	0.00	0.00	0.00	0.00
130 ≤ kW ≤ 560	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
225 ≤ kW < 450	1	0	1996	0.00	0.00	0.00	0.00	0.00
225 ≤ kW < 450	2	0	2001	0.00	0.00	0.00	0.00	0.00
225 ≤ kW < 450	3	0	2006	0.00	0.00	0.00	0.00	0.00
450 ≤ kW ≤ 560	1	0	1996	0.00	0.00	0.00	0.00	0.00
450 ≤ kW < 560	2	0	2002	0.00	0.00	0.00	0.00	0.00
450 ≤ kW ≤ 560	3	0	2006	0.00	0.00	0.00	0.00	0.00
kW > 560	1	0	2000	0.00	0.00	0.00	0.00	0.00
kW > 560	2	0	2006	0.00	0.00	0.00	0.00	0.00
kW > 560	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
EMISSION FACTORS FOR GENERATOR G2 (lb/MMBTU):				**0.00**	**0.00**	**0.00**	**0.00**	**0.000**

Facility: STAKER PARSON COMPANIES dba IDAHO MATERIALS AND CONSTRUCTION
5/25/2017 10:50 **Permit/Facility ID:** P-2017.0016 083-00193 ERROR - IC ENGINE 2 RATING IS LESS THAN 600 bhp

IC Engine 2 Powering an Electrical Generator > 600 hp (447 kW) AP-42 Section 3.4 (diesel fueled, uncontrolled)

Fuel Type Toggle =	1	0 kw	User Input Weight % Sulfur = 0.0015%
Fuel Consumption Rate	0.00 gal/hr		AP-42 3.4-1 SO2 EF = 1.01 x S
Calculated MMBtu/hr	0.00 MMBtu/hr		
Max Daily Operation	0 hr/day		Not an EPA-Certified Generator
Max Annual Operation	0 hrs/yr		

Pollutant	Emission Factor[a] (lb/MMBtu)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM [b]	0.1	0.000	0.00E+00	0.00E+00
PM-10 (total) [d]	0.13	0.000	0.00E+00	0.00E+00
PM-2.5	0.0556	0.000	0.00E+00	0.00E+00
CO [b]	0.85	0.000	0.00E+00	
NOx[b]	3.20	0.000	0.00E+00	0.00E+00
SO_2 [b] (total SOx presumed SO2)	0.001515	0.000	0.000	0.00E+00
VOC [b] (total TOC--> VOCs)	0.09	0.000	0.000	
Lead				
HCl [e]				
Dioxins[e]				
2,3,7,8-TCDD				
Total TCDD				
1,2,3,7,8-PeCDD				
Total PeCDD				
1,2,3,4,7,8-HxCDD[c]				
1,2,3,6,7,8-HxCDD				
1,2,3,7,8,9-HxCDD[c]				
Total HxCDD				
1,2,3,4,6,7,8-Hp-CDD[c]				
Total HpCDD[c]				
Octa CDD[c]				
Total PCDD[c]				
Furans[e]				
2,3,7,8-TCDF				
Total TCDF[c]				
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF[c]				
1,2,3,4,7,8-HxCDF				
1,2,3,6,7,8-HxCDF				
2,3,4,6,7,8-HxCDF				
1,2,3,7,8,9-HxCDF				
Total HxCDF[c]				
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF[c]				
Octa CDF[c]				
Total PCDF[c]				
Total PCDD/PCDF[c]				
Non-PAH HAPs				
Acetaldehyde[c]	2.52E-05	0.00E+00	0.00E+00	**0.00E+00**
Acrolein[c]	7.88E-06	0.00E+00	0.00E+00	0.00E+00
Benzene[c,e]	7.76E-04	0.00E+00	0.00E+00	**0.00E+00**
1,3-Butadiene[c,e]				
Ethylbenzene[e]				
Formaldehyde[c,e]	7.89E-05	0.00E+00	0.00E+00	**0.00E+00**
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[c,e]	2.81E-04	0.00E+00	0.00E+00	0.00E+00
Xylene[c,e]	1.93E-04	0.00E+00	0.00E+00	0.00E+00
POM (7-PAH Group)		0.00E+00		**0.00E+00**

Pollutant	Emission Factor[a] (lb/MMBtu)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr
PAH HAPs				
2-Methylnaphthalene				
3-Methylchloranthrene[e]				
Acenaphthene[c1]	4.68E-06	0.00E+00	0.00E+00	**0.00E+00**
Acenaphthylene[c1]	9.23E-06	0.00E+00	0.00E+00	**0.00E+00**
Anthracene[c1]	1.23E-06	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)anthracene[c1]	6.22E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)pyrene[c1,e]	2.57E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(b)fluoranthene[c1]	1.11E-06	0.00E+00	0.00E+00	**0.00E+00**
Benzo(e)pyrene				
Benzo(g,h,i)perylene[c1]	5.56E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(k)fluoranthene[c1]	2.18E-07	0.00E+00	0.00E+00	**0.00E+00**
Chrysene[c1]	1.53E-06	0.00E+00	0.00E+00	**0.00E+00**
Dibenzo(a,h)anthracene[c1]	3.46E-07	0.00E+00	0.00E+00	**0.00E+00**
Dichlorobenzene				
Fluoranthene[c1]	4.03E-06	0.00E+00	0.00E+00	**0.00E+00**
Fluorene[c1]	1.28E-05	0.00E+00	0.00E+00	**0.00E+00**
Indeno(1,2,3-cd)pyrene[c1]	4.14E-07	0.00E+00	0.00E+00	**0.00E+00**
Naphthalene[c1,e]	1.30E-04	0.00E+00	0.00E+00	**0.00E+00**
Perylene				
Phenanthrene[c1]	4.08E-05	0.00E+00	0.00E+00	**0.00E+00**
Pyrene[c1]	3.71E-06	0.00E+00	0.00E+00	**0.00E+00**
Non-HAP Organic Compounds				
Acetone[e]				
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals				
Antimony[e]				
Arsenic[e]				
Barium[e]				
Beryllium[e]				
Cadmium[e]				
Chromium[e]				
Cobalt[e]				
Copper[e]				
Hexavalent Chromium[e]				
Manganese[e]				
Mercury[e]				
Molybdenum[e]				
Nickel[e]				
Phosphorus[e]				
Silver[e]				
Selenium[e]				
Thallium[e]				
Vanadium[e]				
Zinc[e]				

a) Emission factors are from AP-42
b) AP-42, Table 3.4-1, Gaseous Emission Factors for Large Stationary Diesel and All Stationary Dual Fuel Engines, 10/96
c) AP-42, Table 3.4-3, Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines, Emission Factor Rating E, 10/96
c1) AP-42, Table 3.4-4, PAH Emission Factors for Large Uncontrolled Stationary Diesel Engines, Emission Factor Rating E, 10/96
d) AP-42, Table 3.4-2, Particulate and Particle-Sizing Emission Factors for Large Uncontrolled Stationary Diesel Engines, Emission Factor Rating E, 10/96
e) IDAPA Toxic Air Pollutant

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Facility: **STAKER PARSON COMPANIES dba IDAHO MATERIALS AND CONSTRUCTION**
5/25/2017 10:50 **Permit/Facility ID:** **P-2017.0016** **083-00193**

Max Hourly Production	300 T/hr	96%	T/hr is Aggregate & RAP =	288	T/hr
Max Daily Production	5,000 Tons/day	96%	T/day is Aggregate & RAP =	4,800	T/day
Max Annual Production	300,000 Tons/yr	96%	T/yr is Aggregate & RAP =	288,000	T/yr

Fine PM emitted from RAP use is negligible (see assumptions on page 1 of this spreadsheet). Worst case emissions are for 0% RAP

Aggregate Front-end Loader Drop Points, AP-42 13.2.4 (11/06)

$E = k\,(0.0032) \times (U/5)^{1.3} \;/\; (M/2)^{1.4}$ = 3.31E-03 for PM 1.56E-03 lb/ton for PM10 2.37E-04 lb/ton for PM2.5

k = particle size multiplier 0.74 for PM 0.35 for PM10 0.053 for PM2.5
U = mean wind speed = **10 mph** Wind speed range for source conditions for Equation 1: 1.3 to 15 mph. Select 10 mph as base case wind speed.
M = moisture content = **3 %**

Moisture Content: STAPPA-ALAPCO-EPA, Emission Inventory Improvement Program, Volume II, Chapter 3, Preferred and Alternative Methods for Estimating Air Emissions from Hot Mix Asphalt Plants, Final Report, July 1996: Aggregate moisture content into dryer typically 3 to 7 %
BAAQMD, Hot Mixing Asphalt Facilities, Engineering Evaluation Template, www.baaqmd.gov/pmt/handbook/s11c02ev.htm: Bulk aggregate moisture content typically stabilizes between 3 and 5% by weight.

Windspeed Variation Factors for AERMOD modeling:				PM10		PM2.5	
Wind Category	Upper windspeed (m/sec)	Avg windspeed (m/sec)	Avg windspeed (mph)	E @ avg mph	F = Eavg mph/ E@10mph	E @ avg mph	F = Eavg mph/ E@10mph
Cat 1:	1.54	0.77	1.72	1.59E-04	0.1016	2.41E-05	0.1016
Cat 2:	3.09	2.32	5.18	6.65E-04	0.4251	1.01E-04	0.4251
Cat 3:	5.14	4.12	9.20	1.40E-03	0.8979	2.13E-04	0.8979
Cat 4:	8.23	6.69	14.95	2.64E-03	1.687	3.99E-04	1.687
Cat 5:	10.80	9.52	21.28	4.17E-03	2.670	6.32E-04	2.670
Cat 6:	14.00	12.40	27.74	5.89E-03	3.767	8.92E-04	3.767

Aggregate Front End Loader Drop Points

Drop to storage pile and drop to bins: 288 T/hr 2 Transfer Points

Pollutant	Calculated Emission Factor from AP-42 13.2.4 (lb/ton)	Emissions Per Transfer Point				Total Emissions			
		Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average	Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	3.31E-03	0.95	0.66	0.48	0.11	1.90	1.32	0.95	0.22
PM-10 (total)	1.56E-03	0.45	0.31	0.23	0.05	0.90	0.63	0.45	0.10
PM-2.5	2.37E-04	0.07	0.05	0.03	0.01	0.14	0.09	0.07	0.02

Conveyor and Scalping Screen Emission Points

Moisture/Control %:
AP-42 Table 11.19.2-2, Note b. Moisture content of uncontrolled sources ranged from 0.21 to 1.3%
AP-42 Table 11.19.2-2, Note b. Moisture content of controlled (water spray) sources ranged from 0.55 to 2.88% --> ~91.3% control for screening, ~95% control for conveyor transfer
Bulk aggregate for HMA plants typically stabilizes between 3 and 5% by weight--> Apply additional **90%** control to lb/hr, etc. for the higher moisture.

Aggregate Weigh Conveyor

Transfer from bins to conveyor and from conveyor to scalping screen: 288 T/hr 2 Transfer Points

Pollutant	Calculated Emission Factor from AP-42 13.2.4 (lb/ton)	Emissions Per Transfer Point				Total Emissions			
		Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average	Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	3.31E-03	9.52E-02	6.61E-02	4.76E-02	1.09E-02	1.90E-01	1.32E-01	9.52E-02	2.17E-02
PM-10 (total)	1.56E-03	4.50E-02	3.13E-02	2.25E-02	5.14E-03	9.00E-02	6.25E-02	4.50E-02	1.03E-02
PM-2.5	2.37E-04	6.82E-03	4.73E-03	3.41E-03	7.78E-04	1.36E-02	9.47E-03	6.82E-03	1.56E-03

Aggregate Scalping Screen, AP-42 11.19 (8/04)

Aggregate flow across scalping screen onto conveyor: 288 T/hr

Pollutant	Emission Factor Table 11.19.2-2 SCREENING UNCONTROLLED (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	0.025	0.720	5.00E-01	3.60E-01	8.22E-02
PM-10 (total)	0.0087	0.251	1.74E-01	1.25E-01	2.86E-02
PM-2.5	1.30E-04	0.004	2.60E-03	1.87E-03	4.27E-04

Aggregate Conveyor to Drum (~top end of the drum)

Aggregate transfer from conveyor to drum dryer (1 transfer point): 288 T/hr

Pollutant	Calculated Emission Factor from AP-42 13.2.4 (lb/ton)	Emissions Per Transfer Point			
		Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	3.31E-03	9.52E-02	6.61E-02	4.76E-02	1.09E-02
PM-10 (total)	1.56E-03	4.50E-02	3.13E-02	2.25E-02	5.14E-03
PM-2.5	2.37E-04	6.82E-03	4.73E-03	3.41E-03	7.78E-04

Facility: STAKER PARSON COMPANIES dba IDAHO MATERIALS AND CONSTRUCTION
5/25/2017 10:50 Permit/Facility ID: P-2017.0016 083-00193

Asphalt Tank Heater - #2 Oil Fired, Estimated GHG Emissions Using AP-42 Sections 11.1 (HMA Plants) & 1.3 (Fuel Oil Combustion)

Hot Mix Plant Fuel Type Toggle (#2) = 1
Hot Mix Plant Fuel Type Toggle (Used Oil) = 1
Hot Mix Plant Fuel Type Toggle (NG) = 1
Hot Mix Plant Fuel Type Toggle (LPG) = 1
Tank Heater Fuel Type Toggle (NG) = 1
Tank Heater Fuel Type Toggle (#2) = 1

Note: CO2e emissions from the silo, loadout operation, and the tanks were assumed to be negligible (less than 1 ton per year).

Green House Gas Emissions When Combusting #2 Fuel Oil

Asphalt Plant Emissions	Emission Factor (EF)	EF Units	EF Source	Emissions (T/yr)	Global Warming Potential	CO_2e (T/yr)
CO_2	33.00	lb/T	AP-42 Table 11.1-7	4,950.00	1.00	4,950.00
Methane	0.012	lb/T	AP-42 Table 11.1-8	1.80	21.00	37.80
N_2O	0.26	lb/10^3 gal	AP-42 Table 1.3-8	0.094870	310.00	29.41

Tank Heater	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e T/yr
CO_2	Assumes all carbon is converted to CO_2			843.84	1	843.84
Methane	0.216	lb/10^3 gal	AP-42 Table 1.3-3	6.90E-03	21	0.14
N_2O	0.26	lb/10^3 gal	AP-42 Table 1.3-8	8.31E+00	310	2576.28

Green House Gas Emissions When Combusting Used Oil

Asphalt Plant Emissions	Emission Factor (EF)	EF Units	EF Source	Emissions (T/yr)	Global Warming Potential	CO_2e (T/yr)
CO_2	33.00	lb/T	AP-42 Table 11.1-7	4,950.00	1.00	4,950.00
Methane	0.012	lb/T	AP-42 Table 11.1-8	1.80	21.00	37.80
N_2O	0.53	lb/10^3 gal	AP-42 Table 1.3-8	0.193388	310.00	59.95

Green House Gas Emissions When Combusting Natural Gas

Asphalt Plant Emissions	Emission Factor (EF)	EF Units	EF Source	Emissions (T/yr)	Global Warming Potential	CO_2e (T/yr)
CO_2	33.00	lb/T	AP-42 Table 11.1-7	4,950.00	1.00	4,950.00
Methane	0.012	lb/T	AP-42 Table 11.1-8	1.80	21.00	37.80
N_2O	0.26	lb/10^3 gal	AP-42 Table 1.3-8	0.094870	310.00	29.41

Tank Heater	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e T/yr
CO_2	0.12	lb/scf	AP-42 Table 1.4-2	515.29	1	515.29
Methane	0.0000023	lb/scf	AP-42 Table 1.4-2	9.88E-03	21	0.21
N_2O	0.0000022	lb/scf	AP-42 Table 1.4-2	9.45E-03	310	2.93

Green House Gas Emissions When Combusting LPG

Asphalt Plant Emissions	Emission Factor (EF)	EF Units	EF Source	Emissions (T/yr)	Global Warming Potential	CO_2e (T/yr)
CO_2	33.00	lb/T	AP-42 Table 11.1-7	4,950.00	1.00	4,950.00
Methane	0.012	lb/T	AP-42 Table 11.1-8	1.80	21.00	37.80
N_2O	0.26	lb/10^3 gal	AP-42 Table 1.3-8	0.094870	310.00	29.41

Green House Gas Emissions When Combusting Diesel Fuel

IC Engine 1 < 600 bhp	Emission Factor (EF)	EF Units	EF Source	Emissions (T/yr)	Global Warming Potential	CO_2e (T/yr)
CO_2	1.16	lb/bhp-hr	AP-42 Table 3.4-1	0.00	1.00	0.00

IC Engine 2 > 600 bhp	Emission Factor (EF)	EF Units	EF Source	Emissions (T/yr)	Global Warming Potential	CO_2e (T/yr)
CO_2	1.16	lb/bhp-hr	AP-42 Table 3.4-1	0.00	1.00	0.00

Total Green House Gas Emissions

Total Emissions	CO_2e (T/yr)
CO_2	5,793.84
Methane	38.01
N_2O	2,636.23
Grand Total	**8,468.08**

Facility: STAKER PARSON COMPANIES dba IDAHO MATERIALS AND CONSTRUCTI
5/25/2017 10:50 Permit/Facility ID: P-2017.0016 083-00193

EMISSION INVENTORY

POUNDS PER HOUR

Max Controlled Emissions of Any Pollutant from Drum Mix HMA Plant Fabric Filter, Tank Heater, Generator, Silo Fill/Load-out

A. Drum Mix Plant: 300 Tons/hour 1,000 Hours/year 300,000 Tons/year 5,000 Tons/day
Maximum emission for each pollutant from any fuel-burning options selected on "Facility Data" worksheet. Fuels Selected = #2 Fuel Oil Used Oil Natural Gas LPG/Propane
B. Tank Heater: 1.0000 MMBtu/hr 8,760 Hours/year 24 hrs/day
Maximum emission for each pollutant for heater burning any fuel selected on "Facility Data" worksheet. Fuels Selected = #2 Fuel Oil Natural Gas
C1. IC Engine 1: 0.00 gal/hour 0 Hours/year IC Engine < 600hp #2 Fuel Oil 0 hrs/day
C2. IC Engine 2: 0.00 gal/hour 0 Hours/year IC Engine > 600hp #2 Fuel Oil 0 hrs/day

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C IC Engine 1 + IC Engine 2 Max Emission Rate for Pollutant (lb/hr)	D Load-out & Silo Filling Emission Rate for Pollutant (lb/hr)	E TOTAL of Max Emission Rates from A, B, C & D (lb/hr)
PM (total)	9.90	2.41E-02	0.00E+00	3.32E-01	10.26
PM-10 (total)	6.90	1.65E-02	0.00E+00	3.32E-01	7.25
PM-2.5	6.69	1.12E-02	0.00E+00	3.32E-01	7.03
CO	39.00	8.24E-02	0.00E+00	7.59E-01	39.84
NOx	16.50	1.75E-01	0.00E+00		16.68
SO_2	26.70	1.55E-03	0.00E+00		26.70
VOC	9.60	5.39E-03	0.00E+00	1.21E+00	10.81
Lead	4.50E-03	1.10E-05	0.00E+00		4.51E-03
HCl [e]	6.30E-02	0.00E+00	0.00E+00		6.30E-02
Dioxins [a]					
2,3,7,8-TCDD	7.19E-12				7.19E-12
Total TCDD	3.18E-11				3.18E-11
1,2,3,7,8-PeCDD	1.06E-11				1.06E-11
Total PeCDD	7.53E-10				7.53E-10
1,2,3,4,7,8-HxCDD	1.44E-11	5.04E-12			1.94E-11
1,2,3,6,7,8-HxCDD	4.45E-11				4.45E-11
1,2,3,7,8,9-HxCDD	3.36E-11	5.55E-12			3.91E-11
Total HxCDD	4.11E-10				4.11E-10
1,2,3,4,6,7,8-Hp-CDD	1.64E-10	1.09E-10			2.74E-10
Total HpCDD	6.51E-10	1.45E-10			7.97E-10
Octa CDD	8.56E-10	1.17E-09			2.02E-09
Total PCDD [b]	2.71E-09	1.46E-09			4.17E-09
Furans [a]					
2,3,7,8-TCDF	3.32E-11				3.32E-11
Total TCDF	1.27E-10	2.41E-11			1.51E-10
1,2,3,7,8-PeCDF	1.47E-10				1.47E-10
2,3,4,7,8-PeCDF	2.88E-11				2.88E-11
Total PeCDF	2.88E-09	3.50E-12			2.89E-09
1,2,3,4,7,8-HxCDF	1.37E-10				1.37E-10
1,2,3,6,7,8-HxCDF	4.11E-11				4.11E-11
2,3,4,6,7,8-HxCDF	6.51E-11				6.51E-11
1,2,3,7,8,9-HxCDF	2.88E-10				2.88E-10
Total HxCDF	4.45E-10	1.46E-11			4.60E-10
1,2,3,4,6,7,8-HpCDF	2.23E-10				2.23E-10
1,2,3,4,7,8,9-HpCDF	9.25E-11				9.25E-11
Total HpCDF	3.42E-10	7.06E-11			4.13E-10
Octa CDF	1.64E-10	8.76E-11			2.52E-10
Total PCDF [b]	1.37E-09	2.26E-10			1.60E-09
Total PCDD/PCDF [b]	4.11E-09	1.68E-09	0.00E+00		5.79E-09
Non-PAH HAPs					
Acetaldehyde [e]	4.45E-02		0.00E+00		4.45E-02
Acrolein [e]	5.42E-03		0.00E+00		5.42E-03
Benzene [e]	1.34E-02	2.06E-06	0.00E+00	2.08E-04	1.36E-02
1,3-Butadiene [e]			0.00E+00		0.00E+00
Ethylbenzene [e]	5.00E-02			3.39E-03	5.34E-02
Formaldehyde [e]	1.06E-01	7.35E-06	0.00E+00	3.01E-03	1.09E-01
Hexane [e]	1.92E-01	1.76E-03		3.84E-03	1.97E-01
Isooctane	8.33E-03			2.35E-05	8.36E-03
Methyl Ethyl Ketone [e]	4.17E-03			1.41E-03	5.58E-03
Pentane [e]		2.55E-03			2.55E-03
Propionaldehyde [e]	2.71E-02				2.71E-02
Quinone [e]	3.33E-02				3.33E-02
Methyl chloroform [e]	1.00E-02				1.00E-02
Toluene [e]	6.04E-01	3.33E-06	0.00E+00	3.39E-03	6.08E-01
Xylene [e]	4.17E-02		0.00E+00	1.70E-02	5.87E-02
POM (7-PAH Group) [e]	1.85E-05	7.39E-07	0.00E+00	3.89E-05	5.84E-05
TOTAL PAH HAPs	3.03E-02	1.69E-04	0.00E+00	1.66E-03	3.72E-02

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C IC Engine IC1 + IC2 Max Emission Rate for Pollutant (lb/hr)	D Load-out & Silo Filling Emission Rate for Pollutant (lb/hr)	E TOTAL of Max Emission Rates from A, B, C & D (lb/hr)
PAH HAPs					
2-Methylnaphthalene	5.82E-03	2.35E-08		7.36E-04	6.56E-03
3-Methylchloranthrene [e]	0.00E+00	1.76E-09			1.76E-09
Acenaphthene	4.79E-05	3.87E-06	0.00E+00	7.12E-05	1.23E-04
Acenaphthylene	7.53E-04	1.46E-06	0.00E+00	4.49E-05	7.99E-04
Anthracene	1.06E-04	1.31E-06	0.00E+00	1.95E-05	1.27E-04
Benzo(a)anthracene [e]	7.19E-06	1.76E-09	0.00E+00	7.09E-06	1.43E-05
Benzo(a)pyrene [e]	3.36E-07	1.18E-09	0.00E+00	2.69E-07	6.05E-07
Benzo(b)fluoranthene [e]	3.42E-06	7.30E-07	0.00E+00	8.87E-07	5.04E-06
Benzo(e)pyrene	3.77E-06	0.00E+00		1.74E-06	5.50E-06
Benzo(g,h,i)perylene	1.37E-06	1.18E-09	0.00E+00	2.22E-07	1.59E-06
Benzo(k)fluoranthene [e]	1.40E-06	1.76E-09	0.00E+00	2.57E-07	1.66E-06
Chrysene [e]	6.16E-06	1.76E-09	0.00E+00	3.03E-05	3.65E-05
Dibenzo(a,h)anthracene [e]	0.00E+00	1.18E-09	0.00E+00	4.32E-08	4.44E-08
Dichlorobenzene	0.00E+00	1.18E-06			1.18E-06
Fluoranthene	2.09E-05	3.21E-07	0.00E+00	1.89E-05	4.01E-05
Fluorene	3.77E-04	2.34E-07	0.00E+00	1.78E-04	5.55E-04
Indeno(1,2,3-cd)pyrene [e]	2.40E-07	1.76E-09	0.00E+00	5.49E-08	2.96E-07
Naphthalene [e]	2.23E-02	1.24E-04	0.00E+00	3.04E-04	2.27E-02
Perylene	3.01E-07	0.00E+00		5.18E-06	5.48E-06
Phenanthrene	7.86E-04	3.56E-05	0.00E+00	2.51E-04	1.07E-03
Pyrene	1.03E-04	2.34E-07	0.00E+00	5.58E-05	1.59E-04
Non-HAP Organic Compounds					
Acetone [e]	1.73E-01	0.00E+00		1.60E-03	1.75E-01
Benzaldehyde	2.29E-02	0.00E+00			2.29E-02
Butane	1.40E-01	2.06E-03			1.42E-01
Butyraldehyde	3.33E-02	0.00E+00			3.33E-02
Crotonaldehyde [e]	1.79E-02	0.00E+00			1.79E-02
Ethylene	1.46E+00	0.00E+00		3.41E-02	1.49E+00
Heptane	1.96E+00	0.00E+00			1.96E+00
Hexanal	2.29E-02	0.00E+00			2.29E-02
Isovaleraldehyde	6.67E-03	0.00E+00			6.67E-03
2-Methyl-1-pentene	8.33E-01	0.00E+00			8.33E-01
2-Methyl-2-butene	1.21E-01	0.00E+00			1.21E-01
3-Methylpentane	3.96E-02	0.00E+00			3.96E-02
1-Pentene	4.58E-01	0.00E+00			4.58E-01
n-Pentane	4.38E-02	0.00E+00			4.38E-02
Valeraldehyde [e]	1.40E-02	0.00E+00			1.40E-02
Metals					
Antimony [e]	3.75E-05	3.83E-05			7.58E-05
Arsenic [e]	1.92E-05	9.63E-06			2.88E-05
Barium [e]	1.21E-03	1.86E-05			1.23E-03
Beryllium [e]	0.00E+00	2.03E-07			2.03E-07
Cadmium [e]	1.40E-05	2.90E-06			1.69E-05
Chromium [e]	1.15E-03	6.17E-06			1.15E-03
Cobalt [e]	5.42E-05	4.39E-06			4.93E-05
Copper [e]	6.46E-04	1.26E-05			6.59E-04
Hexavalent Chromium [e]	1.54E-05	1.81E-06			1.72E-05
Manganese [e]	1.60E-03	2.19E-05			1.63E-03
Mercury [e]	5.42E-04	8.25E-07			5.42E-04
Molybdenum [e]	0.00E+00	5.74E-06			5.74E-06
Nickel [e]	2.16E-03	6.17E-04			2.77E-03
Phosphorus [e]	5.83E-03	6.90E-05			5.90E-03
Silver [e]	1.00E-04	0.00E+00			1.00E-04
Selenium [e]	7.29E-05	4.96E-06			7.79E-05
Thallium [e]	8.54E-07	0.00E+00			8.54E-07
Vanadium [e]	0.00E+00	2.32E-04			2.32E-04
Zinc [e]	1.27E-02	2.12E-04			1.29E-02

e) IDAPA Toxic Air Pollutant

Criteria Pollutant lb/hr emissions are maximum 1-hr averages
TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.
Pollutants shown in blue text are emitted only when burning Used Oil, but not when burning #2 Fuel Oil or Natural Gas

Facility: STAKER PARSON COMPANIES dba IDAHO MATERIAL
5/25/2017 10:50 Permit/Facility ID: P-2017.0016 083-00193

EMISSION INVENTORY

POUNDS PER HOUR

Max Controlled Emissions of Any Pollutant from Drum Mix HMA Plant Fabric Filter, Tank Heater, Generator, Silo Fill/Load-out

A. Drum Mix Plant: 300 Tons/hour 1,000 Hours/year 300,000 Tons/year HMA throughout 5,000 hrs/day
Maximum emission for each pollutant from any fuel-burning option selected. Fuels Selected = #2 Fuel Oil Used Oil Natural Gas LPG/Propane
B. Tank Heater: 1.0000 MMBtu/hr 8,760 Hours/year 24 hrs/day
Maximum emission for each pollutant from any fuel-burning option selected. Fuels Selected = #2 Fuel Oil Natural Gas
C1. IC Engine 1: 0.00 gal/hour 0 Hours/year #2 Fuel Oil Generator < 600hp 0 hrs/day
C2. IC Engine 2: 0.00 gal/hour 0 Hours/year #2 Fuel Oil Generator > 600hp 0 hrs/day

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C IC Engine Max Emission Rate for Pollutant (lb/hr)	D Load-out & Silo Filling Emission Rate for Pollutant (lb/hr)	E TOTAL of Max Emission Rates from A, B, C & D (lb/hr)
non-PAH HAPs [e]					
Bromomethane [e]				2.06E-04	2.06E-04
2-Butanone (see Methyl Ethyl Ketone)					
Carbon disulfide [e]				5.19E-04	5.19E-04
Chloroethane (Ethyl chloride [e])				1.03E-04	1.03E-04
Chloromethane (Methyl chloride [e])				7.14E-04	7.14E-04
Cumene				9.53E-04	9.53E-04
n-Hexane					
Methylene chloride (Dichloromethane [e])				6.86E-06	6.86E-06
MTBE					
Styrene [e]				2.00E-04	2.00E-04
Tetrachloroethene (Tetrachloroethylene [e])				6.67E-05	6.67E-05
1,1,1-Trichloroethane (Methyl chloroform [e])					
Trichloroethene (Trichloroethylene [e])					
Trichlorofluoromethane				1.13E-05	1.13E-05
m-/p-Xylene [e]				8.63E-03	8.63E-03
o-Xylene [e]				8.35E-03	8.35E-03
Phenol [e,f]				8.35E-04	8.35E-04
Non-HAP Organic Compounds					
Methane				7.16E-01	7.16E-01

e) IDAPA Toxic Air Pollutant

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Facility: STAKER PARSON COMPANIES dba IDAHO MATERIALS AND CONSTRUC
5/25/2017 10:50 Permit/Facility ID: P-2017.0016 083-00193

EMISSION INVENTORY
TONS PER YEAR

Max Controlled Emissions of Any Pollutant from Drum Mix HMA Plant Fabric Filter, Tank Heater, Generator, Silo Fill/Load-out

A. Drum Mix Plant: 300 Tons/hour 1,000 Hours/year 300,000 Tons/year HMA throughout 5,000 hrs/day
Maximum emission for each pollutant from any fuel-burning options selected on "Facility Data" worksheet. Fuels Selected = #2 Fuel Oil Used Oil Natural Gas LPG/Propane
B. Tank Heater: 1.0000 MMBtu/hr 8,760 Hours/year 24 hrs/day
Maximum emission for each pollutant for heater burning any fuel selected on "Facility Data" worksheet. Fuels Selected = #2 Fuel Oil Natural Gas
C1. IC Engine 1: 0.00 gal/hour 0 Hours/year IC Engine <600hp #2 Fuel Oil 0 hrs/day
C2. IC Engine 2: 0.00 gal/hour 0 Hours/year IC Engine > 600hp #2 Fuel Oil 0 hrs/day

Pollutant	A Drum Mix Max Emission Rate for Pollutant (T/yr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (T/yr)	C IC Engine IC1 + IC2 Max Emission Rate for Pollutant (T/yr)	D Load-out & Silo Filling. Emission Rate for Pollutant (T/yr)	E POINT SOURCE TOTAL of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives (D)
PM (total)	4.95	1.05E-01	0.00E+00	1.66E-01	5.06
PM-10 (total)	3.45	7.35E-02	0.00E+00	1.66E-01	3.52
PM-2.5	3.35	4.92E-02	0.00E+00	1.66E-01	3.39
CO	19.50	3.61E-01	0.00E+00	3.79E-01	19.86
NOx	8.25	7.67E-01	0.00E+00		9.02
SO_2	13.35	6.81E-03	0.00E+00		13.36
VOC	4.80	2.36E-02	0.00E+00	6.05E-01	4.82
Lead	2.25E-03	4.83E-05	0.00E+00		2.30E-03
HCl[e]	3.15E-02	0.00E+00	0.00E+00		3.15E-02
Dioxins[e]					
2,3,7,8-TCDD	3.15E-11				3.15E-11
Total TCDD	1.40E-10				1.40E-10
1,2,3,7,8-PeCDD	4.65E-11				4.65E-11
Total PeCDD	3.30E-09				3.30E-09
1,2,3,4,7,8-HxCDD	6.30E-11	2.21E-11			8.51E-11
1,2,3,6,7,8-HxCDD	1.95E-10				1.95E-10
1,2,3,7,8,9-HxCDD	1.47E-10	2.43E-11			1.71E-10
Total HxCDD	1.80E-09				1.80E-09
1,2,3,4,6,7,8-Hp-CDD	7.20E-10	4.79E-10			1.20E-09
Total HpCDD	2.85E-09	6.39E-10			3.49E-09
Octa CDD	3.75E-09	5.11E-09			8.86E-09
Total PCDD[e]	1.19E-08	6.39E-09			1.83E-08
Furans[e]					
2,3,7,8-TCDF	1.45E-10				1.46E-10
Total TCDF	5.55E-10	1.05E-10			6.60E-10
1,2,3,7,8-PeCDF	6.45E-10				6.45E-10
2,3,4,7,8-PeCDF	1.26E-10				1.26E-10
Total PeCDF	1.26E-08	1.53E-11			1.26E-08
1,2,3,4,7,8-HxCDF	6.00E-10				6.00E-10
1,2,3,6,7,8-HxCDF	1.80E-10				1.80E-10
2,3,4,6,7,8-HxCDF	2.85E-10				2.85E-10
1,2,3,7,8,9-HxCDF	1.26E-09				1.26E-09
Total HxCDF	1.95E-09	6.39E-11			2.01E-09
1,2,3,4,6,7,8-HpCDF	9.75E-10				9.75E-10
1,2,3,4,7,8,9-HpCDF	4.05E-10				4.05E-10
Total HpCDF	1.50E-09	3.10E-10			1.81E-09
Octa CDF	7.20E-10	3.84E-10			1.10E-09
Total PCDF[e]	6.00E-09	9.91E-10			6.99E-09
Total PCDD/PCDF[e]	1.80E-08	7.35E-09			2.54E-08
Non-PAH HAPs					
Acetaldehyde[e]	1.95E-01		0.00E+00		1.95E-01
Acrolein[e]	3.90E-03		0.00E+00		3.90E-03
Benzene[e]	5.85E-02	9.02E-06	0.00E+00	9.09E-04	5.85E-02
1,3-Butadiene[e]	0.00E+00		0.00E+00		0.00E+00
Ethylbenzene[e]	3.60E-02			2.44E-03	3.60E-02
Formaldehyde[e]	4.65E-01	3.22E-04	0.00E+00	1.32E-02	4.65E-01
Hexane[e]	1.35E-01	7.73E-03		2.76E-03	1.46E-01
Isooctane	6.00E-03			1.69E-05	6.00E-03
Methyl Ethyl Ketone[e]	3.00E-03			1.02E-03	3.00E-03
Pentane[e]	0.00E+00	1.12E-02			1.12E-02
Propionaldehyde[e]	1.95E-02				1.95E-02
Quinone[e]	2.40E-02				2.40E-02
Methyl chloroform[e]	7.20E-03				7.20E-03
Toluene[e]	4.35E-01	1.45E-05	0.00E+00	2.44E-03	4.35E-01
Xylene[e]	3.00E-02	0.00E+00	0.00E+00	1.22E-02	3.00E-02
TOTAL Federal HAPs (T/yr)					1.64E+00

Pollutant	A Drum Mix Max Emission Rate for Pollutant (T/yr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (T/yr)	C IC Engine IC1 + IC2 Max Emission Rate for Pollutant (T/yr)	D Load-out & Silo Filling Emission Rate for Pollutant (T/yr)	E POINT SOURCE TOTAL of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives (D)
PAH HAPs					
2-Methylnaphthalene	2.55E-02	1.03E-07		3.22E-03	2.55E-02
3-Methylchloranthrene[e]	0.00E+00	7.73E-09			7.73E-09
Acenaphthene	2.10E-04	1.69E-05	0.00E+00	3.12E-04	2.27E-04
Acenaphthylene	3.30E-03	6.39E-06	0.00E+00	1.97E-05	3.31E-03
Anthracene	4.65E-04	5.75E-06	0.00E+00	8.53E-06	4.71E-04
Benzo(a)anthracene[e]	3.15E-05	7.73E-09	0.00E+00	3.10E-05	3.15E-05
Benzo(a)pyrene[e]	1.47E-06	5.15E-09	0.00E+00	1.18E-06	1.48E-06
Benzo(b)fluoranthene[e]	1.50E-05	3.20E-06	0.00E+00	3.69E-06	1.82E-05
Benzo(e)pyrene	1.65E-05	0.00E+00		7.61E-06	1.65E-05
Benzo(g,h,i)perylene	6.00E-06	5.15E-09	0.00E+00	9.72E-07	6.01E-06
Benzo(k)fluoranthene[e]	6.15E-06	7.73E-09	0.00E+00	1.13E-06	6.16E-06
Chrysene[e]	2.70E-05	7.73E-09	0.00E+00	1.33E-04	2.70E-05
Dibenzo(a,h)anthracene	0.00E+00	5.15E-09	0.00E+00	1.89E-07	5.15E-09
Dichlorobenzene	0.00E+00	5.15E-06			5.15E-06
Fluoranthene	9.15E-05	1.41E-06	0.00E+00	8.27E-05	9.29E-05
Fluorene	1.65E-03	1.02E-06	0.00E+00	7.76E-04	1.65E-03
Indeno(1,2,3-cd)pyrene[e]	1.05E-06	7.73E-09	0.00E+00	2.40E-07	1.06E-06
Naphthalene[e]	9.75E-02	5.43E-04	0.00E+00	1.33E-03	9.80E-02
Perylene	1.32E-06	0.00E+00		2.27E-05	1.32E-06
Phenanthrene	3.45E-03	1.57E-04	0.00E+00	1.10E-03	3.61E-03
Pyrene	4.50E-04	1.02E-06	0.00E+00	2.44E-04	4.51E-04
Non-HAP Organic Compounds					
Acetone[e]	1.25E-01	0.00E+00		1.30E-03	1.25E-01
Benzaldehyde	1.65E-02	0.00E+00			1.65E-02
Butane	1.01E-01	9.02E-03			1.10E-01
Butyraldehyde	2.40E-02	0.00E+00			2.40E-02
Crotonaldehyde[e]	1.29E-02	0.00E+00			1.29E-02
Ethylene	1.05E+00	0.00E+00		2.45E-02	1.05E+00
Heptane	1.41E+00	0.00E+00			1.41E+00
Hexanal	1.65E-02	0.00E+00			1.65E-02
Isovaleraldehyde	4.80E-03	0.00E+00			4.80E-03
2-Methyl-1-pentene	6.00E-01	0.00E+00			6.00E-01
2-Methyl-2-butene	8.70E-02	0.00E+00			8.70E-02
3-Methylpentane	2.85E-02	0.00E+00			2.85E-02
1-Pentene	3.30E-01	0.00E+00			3.30E-01
n-Pentane[e]	3.15E-02	0.00E+00			3.15E-02
Valeraldehyde[e]	1.01E-02	0.00E+00			1.01E-02
Metals					
Antimony[e]	2.70E-05	1.68E-04			1.95E-04
Arsenic[e]	8.40E-05	4.22E-05			1.26E-04
Barium[e]	8.70E-04	8.21E-05			9.52E-04
Beryllium[e]	0.00E+00	8.89E-07			8.89E-07
Cadmium[e]	6.15E-05	1.27E-05			7.42E-05
Chromium[e]	8.25E-04	2.70E-05			8.52E-04
Cobalt[e]	3.90E-06	1.92E-04			1.96E-04
Copper[e]	4.65E-04	5.63E-05			5.21E-04
Hexavalent Chromium[e]	6.75E-05	7.93E-06			7.54E-05
Manganese[e]	1.16E-03	9.59E-05			1.25E-03
Mercury[e]	3.90E-04	3.61E-06			3.94E-04
Molybdenum[e]	0.00E+00	2.52E-05			2.52E-05
Nickel[e]	9.45E-03	2.70E-03			1.22E-02
Phosphorus[e]	4.20E-03	3.02E-04			4.50E-03
Silver[e]	7.20E-05	0.00E+00			7.20E-05
Selenium[e]	5.25E-05	2.18E-05			7.43E-05
Thallium[e]	6.15E-07				6.15E-07
Vanadium[e]	0.00E+00	1.02E-03			1.02E-03
Zinc[e]	9.15E-03	9.30E-04			1.01E-02

Facility: STAKER PARSON COMPANIES dba IDAHO MATERIAL
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EMISSION INVENTORY
TONS PER YEAR

Max Controlled Emissions of Any Pollutant from Drum Mix HMA Plant Fabric Filter, Tank Heater, Generator, Silo Fill/Load-out

A. Drum Mix Plant: 300 Tons/hour 1,000 Hours/year 300,000 Tons/year 5,000 Tons/day
Maximum emission for each pollutant from any fuel-burning option selected. Fuels Selected = #2 Fuel Oil Used Oil Natural Gas LPG/Propane
B. Tank Heater: 1.0000 MMBtu/hr 8,760 Hours/year 24 hrs/day
Maximum emission for each pollutant from any fuel-burning option selected Fuel's Selected = #2 Fuel Oil Natural Gas
C1. Generator G1: 0.00 gal/hour 0 Hours/year #2 Fuel Oil IC Engine <600hp 0 hrs/day
C2. Generator G2: 0.00 gal/hour 0 Hours/year #2 Fuel Oil IC Engine > 600hp 0 hrs/day

Pollutant	A Drum Mix Max Emission Rate for Pollutant (T/yr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (T/yr)	C Generator Max Emission Rate for Pollutant (T/yr)	D Load-out, Silo Filling, & Tank Storage Emission Rate for Pollutant (T/yr)	E POINT SOURCE TOTAL of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives (D)
non-PAH HAPs[e]					
Bromomethane[e]				1.49E-04	0.00E+00
2-Butanone (see Methyl Ethyl Ketone)					0.00E+00
Carbon disulfide[e]				3.74E-04	0.00E+00
Chloroethane (Ethyl chloride[e])				7.44E-05	0.00E+00
Chloromethane (Methyl chloride[e])				5.14E-04	0.00E+00
Cumene				6.86E-04	0.00E+00
n-Hexane				0.00E+00	0.00E+00
Methylene chloride (Dichloromethane[e])				4.94E-06	0.00E+00
MTBE					0.00E+00
Styrene[e]				1.44E-04	0.00E+00
Tetrachloroethane (Tetrachloroethylene[e])				4.80E-05	0.00E+00
1,1,1-Trichloroethane (Methyl chloroform[e])				0.00E+00	0.00E+00
Trichloroethane (Trichloroethylene[e])				0.00E+00	0.00E+00
Trichlorofluoromethane				8.11E-06	0.00E+00
m-/p-Xylene[e]				6.21E-03	0.00E+00
o-Xylene[e]				6.03E-03	0.00E+00
Phenol[e]				6.03E-04	0.00E+00
Non-HAP Organic Compounds					
Methane				5.16E-01	0.00E+00

e) IDAPA Toxic Air Pollutant

Facility: STAKER PARSON COMPANIES dba IDAHO MATERIALS AND CONSTRU

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CRITERIA POLLUTANT MODELING

POUNDS PER HOUR - POINT AND PSEUDO-STACK SOURCES

Maximum Controlled Emissions of Any Pollutant from Drum Mix HMA Plant with Fabric Filter, Tank Heater, Generator, Silo Fill/Load-out

A. Drum Mix Plant: 300 Tons/hour 1,000 Hours/year 300,000 Tons/year 5,000 Tons/day 16.7 hr/day 1,000 hr/yr

Maximum emission for each pollutant from any fuel-burning options selected on "Facility Data" worksheet. Fuels Selected = #2 Fuel Oil | Used Oil | Natural Gas | LPG/Propane

B. Tank Heater: 1.0000 MMBtu Rate 8,760 Hours/year 0.0015% S 0.5000% S 24 hrs/day

Maximum emission for each pollutant for heater burning any fuel selected on "Facility Data" worksheet. Fuels Selected = 0.0015% S #2 Fuel Oil | Natural Gas

C1. IC Engine 1: 0.00 gal/hour 0 Hours/year IC Engine < 600hp 0.0015% S #2 Fuel Oil 0 hrs/day

C2. IC Engine 2: 0.00 gal/hour 0 Hours/year IC Engine > 600hp 0.0015% S #2 Fuel Oil 0 hrs/day

Max 1-hour, 3-hour, and 8-hour averages

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphaltic Oil Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 IC1< 600 bhp Generator Max Emission Rate for Pollutant (lb/hr)	C2 IC2 > 600 bhp Generator Max Emission Rate for Pollutant (lb/hr)	D1 Silo Filling Emission Rate for Pollutant (lb/hr)	D2 Load-out Emission Rate for Pollutant (lb/hr)	See Scalping Scrn & Transfer Points" worksheet for 1-hour, 24-hour, and annual PM10 emission rates from those sources.
PM (total)							
PM-10 (total)	6.90	1.68E-02	0.00E+00	0.00E+00	1.76E-01	1.57E-01	
PM-2.5	6.69	1.12E-02	0.00E+00	0.00E+00	1.76E-01	1.57E-01	
CO	39.00	8.24E-02	0.00E+00	0.00E+00	3.54E-01	4.05E-01	
NOx	16.50	1.75E-01	0.00E+00	0.00E+00			
SO_2	26.70	1.55E-03	0.00E+00	0.00E+00			
VOC	9.60	5.39E-03	0.00E+00	0.00E+00	3.66E-02	1.17E+00	
Lead	4.50E-03	1.10E-05					

Max 24-hour averages

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 G1 < 600 hp Generator Max Emission Rate for Pollutant (lb/hr)	C2 G2 > 600hp Generator Max Emission Rate for Pollutant (lb/hr)	D1 Silo Filling Emission Rate for Pollutant (lb/hr)	D2 Load-out Emission Rate for Pollutant (lb/hr)	See Scalping Scrn & Transfer Points" worksheet for 1-hour, 24-hour, and annual PM10 emission rates from those sources.
PM (total)							
PM-10 (total)	4.79	1.68E-02	0.00E+00	0.00E+00	1.22E-01	1.09E-01	
PM-2.5	4.65	1.12E-02	0.00E+00	0	1.22E-01	1.09E-01	
CO							
NOx							
SO_2	18.54	1.55E-03	0.00E+00	0.00E+00			
VOC							
Lead							

Max Annual averages

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 G1< 600 hp Generator Max Emission Rate for Pollutant (lb/hr)	C2 G2 > 600hp Generator Max Emission Rate for Pollutant (lb/hr)	D1 Silo Filling Emission Rate for Pollutant (lb/hr)	D2 Load-out Emission Rate for Pollutant (lb/hr)	See Scalping Scrn & Transfer Points" worksheet for 1-hour, 24-hour, and annual PM10 emission rates from those sources.
PM (total)							
PM-10 (total)	0.79	1.68E-02	0.00E+00	0.00E+00	2.01E-02	1.79E-02	
PM-2.5	0.76	1.12E-02					
CO							
NOx	1.88	1.75E-01	0.00	0.00			
SO_2	3.05	0.00	0.00E+00	0.00			
VOC							
Lead							

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TAPs EL Screen - ALL SOURCES

566 pollutants are shown in bold

Max Emissions of Any Pollutant from Drum Mix HMA Plant Fabric Filter, Tank Heater, Silo Fill/Load-out - Generator not included

A. Drum Mix Plant: 300 Tons/hour 1,000 Hours/year 300,000 Tons/year 5,000 Tons/day

Maximum emission for each pollutant from any fuel-burning option selected on "Facility Data" worksheet

B. Tank Heater: 1.6000 MMBtu Rated 8,760 Hours/year

Maximum emission for each pollutant for heater burning any fuel selected on "Facility Data" worksheet

D. Include all emissions from Load-out/Silo Filling? Yes

Short Term Source Factor (SS EL?) 1

C1. IC Engine G1: 0.00 gal/hour 0 Hours/year IC Engine <600hp #2 Fuel Oil 0 hrs/day

C2. IC Engine G2: 0.00 gal/hour 0 Hours/year IC Engine > 600hp #2 Fuel Oil 0 hrs/day

Pollutant	TOTAL of Max Emission Rates from A, B, & D (lb/hr)	TAPs Screening Emission Limit (EL) Increment[b] (lb/hr)	TAPs Emissions Exceed EL Increment?	Modeled? Meets AAC or AACC?
HCl[a]	0.063	0.05	Exceeds	
Dioxins		Toxic Equivalency Factor[c]	Adjusted Emission Rate (lb/hr)	
2,3,7,8-TCDD	7.15E-12	1.0	7.15E-12	
Total TCDD	3.15E-11	n/a		
1,2,3,7,8-PeCDD	1.06E-11	1.0	1.06E-11	
Total PeCDD	7.53E-10	n/a		
1,2,3,4,7,8-HxCDD	1.94E-11	0.1	1.94E-12	
1,2,3,6,7,8-HxCDD	4.45E-11	0.1	4.45E-12	
1,2,3,7,8,9-HxCDD	3.91E-11	0.1	3.91E-12	
Total HxCDD	4.11E-10	n/a		
1,2,3,4,6,7,8-Hp-CDD	2.74E-10	0.01	2.74E-12	
Total HpCDD	7.97E-10	n/a		
Octa CDD	2.02E-09	0.0003	6.07E-13	
Total PCDD	4.17E-09	n/a		
Furans				
2,3,7,8-TCDF	3.32E-11	0.1	3.32E-12	
Total TCDF	1.51E-10	n/a		
1,2,3,7,8-PeCDF	1.47E-10	0.03	4.42E-12	
2,3,4,7,8-PeCDF	2.88E-11	0.3	8.63E-12	
Total PeCDF	2.83E-09	n/a		
1,2,3,4,7,8-HxCDF	1.37E-10	0.1	1.37E-11	
1,2,3,6,7,8-HxCDF	4.11E-11	0.1	4.11E-12	
2,3,4,6,7,8-HxCDF	6.51E-11	0.1	6.51E-12	
1,2,3,7,8,9-HxCDF	2.88E-10	0.1	2.88E-11	
Total HxCDF	4.60E-10	n/a		
1,2,3,4,6,7,8-HpCDF	2.23E-10	0.01	2.23E-12	
1,2,3,4,7,8,9-HpCDF	9.25E-11	0.01	9.25E-13	
Total HpCDF	4.13E-10	n/a		
Octa CDF	2.52E-10	0.0003	7.56E-14	
Total PCDF	1.60E-09	n/a		
Total PCDD/PCDF	5.79E-09	n/a		
TOTAL	Adjusted lb/hr	TAPs EL for 2,3,7,8 TCDD	Exceeds TAPs EL?	Modeled?
Dioxin/Furans[c]	1.04E-10	1.50E-10	No	
Non-PAH HAPs				
Acetaldehyde	4.45E-02	3.00E-03	Exceeds	
Acrolein	5.42E-03	0.017	No	
Benzene	1.36E-02	8.00E-04	Exceeds	
1,3-Butadiene				
Ethylbenzene	5.34E-02	29	No	
Formaldehyde	1.09E-01	5.10E-04	Exceeds	
Hexane	1.97E-01	12	No	
Isooctane	8.35E-03			
Methyl Ethyl Ketone	5.55E-03	39.3	No	
Pentane	2.55E-03	118	No	
Propionaldehyde	2.71E-02	0.0287	No	
Quinone	3.33E-02	0.027	Exceeds	
Methyl chloroform	1.00E-02	127	No	
Toluene	6.04E-01	25	No	
Xylene	5.87E-02	29	No	

Pollutant	TOTAL of Max Emission Rates from A, B, & D (lb/hr)	TAPs Screening Emission Limit (EL) Increment[b] (lb/hr)	TAPs Emissions Exceed EL Increment?	Modeled? Meets AAC or AACC?
PAH HAPs				
2-Methylnaphthalene	6.56E-03	9.10E-05	Exceeds	
3-Methylchloranthrene	1.76E-09	2.50E-06	No	
Acenaphthene	1.23E-04	9.10E-05	Exceeds	
Acenaphthylene	7.59E-04	9.10E-05	Exceeds	
Anthracene	1.27E-04	9.10E-05	Exceeds	
Benzo(a)anthracene	1.43E-05			see POM
Benzo(a)pyrene	6.05E-07	2.00E-06	No	see POM
Benzo(b)fluoranthene	5.04E-06			see POM
Benzo(e)pyrene	5.50E-06	9.10E-05	No	
Benzo(g,h,i)perylene	1.59E-06	9.10E-05	No	
Benzo(k)fluoranthene	1.66E-06			see POM
Chrysene	3.65E-05			see POM
Dibenzo(a,h)anthracene	4.44E-08			see POM
Dichlorobenzene	1.18E-06	9.10E-05	No	
Fluoranthene	4.01E-05	9.10E-05	No	
Fluorene	5.55E-04	9.10E-05	Exceeds	
Indeno(1,2,3-cd)pyrene	2.56E-07			see POM
Naphthalene[e]	2.27E-02	9.10E-05	Exceeds	
Perylene	5.48E-06	9.10E-05	No	
Phenanthrene	1.07E-03	9.10E-05	Exceeds	
Pyrene	1.59E-04	9.10E-05	Exceeds	
PolycyclicOrganicMatter[d]	5.84E-05	2.00E-06	Exceeds	
Non-HAP Organic Compounds				
Acetone	1.75E-01	119	No	
Benzaldehyde	2.22E-02			
Butane	1.42E-01			
Butyraldehyde	3.33E-02			
Crotonaldehyde	1.79E-02	0.38	No	
Ethylene	1.43E+00			
Heptane	1.56E+00	109	No	
Hexanal	2.29E-02			
Isovaleraldehyde	6.67E-03			
2-Methyl-1-pentene	8.33E-01			
2-Methyl-2-butene	1.21E-01			
3-Methylpentane	3.56E-02			
1-Pentene	4.55E-01			
n-Pentane[e]	4.35E-02	118	No	
Valeraldehyde (n-Valeraldehyde)	1.40E-02	11.7	No	
Metals				
Antimony[f]	7.56E-05	0.033	No	
Arsenic	2.88E-05	1.50E-06	Exceeds	
Barium	1.23E-03	0.033	No	
Beryllium	2.03E-07	2.80E-05	No	
Cadmium	1.69E-05	3.70E-06	Exceeds	
Chromium	1.15E-03	0.033	No	
Cobalt	4.93E-06	0.0033	No	
Copper	6.59E-04	0.013	No	
Hexavalent Chromium	1.72E-05	5.60E-07	Exceeds	
Manganese	1.63E-03	0.067	No	
Mercury	5.47E-04	0.003	No	
Molybdenum	5.74E-06	0.333	No	
Nickel	2.77E-03	2.70E-05	Exceeds	
Phosphorus	5.90E-03	0.007	No	
Silver	1.00E-04	0.007	No	
Selenium	7.73E-05	0.013	No	
Thallium	8.54E-07	0.007	No	
Vanadium	2.32E-04	0.003	No	
Zinc	1.29E-02	0.667	No	

a) Reserved.

b) Toxic Air Pollutants, IDAPA 58.01.01.585 and 586, levels in effect as of February 25, 2009

c) 2005, Van den Berg, et al, The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds. *Toxicological Sciences* 93(2), 223-241 (2006). Accessible at http://toxsci.oxfordjournals.org/cgi/reprint/93/2/223.
Use of the 2005 WHO toxic equivalency factors (TEFs) is consistent with current EPA recommendations for TRI reporting (72 FR 26544, May 10, 2007)
n/a = not available. IDAPA 58.01.01.586, TAPs Carcinogenic Increments: Total of adjusted emission rates are treated as a single TAP (2,3,7,8 TCDD)

d) IDAPA 58.01.01.586, Polycyclic Organic Matter: Emissions of highlighted PAHs h shall be considered together as one TAP equivalent in potency to benzo(a)pyrene.

e) Naphthalene is listed as a noncarcinogenic TAP in IDAPA 58.01.01.585 (EL = 3.33 lb/hr), but must also be considered as a carcinogenic PAH (EL = 9.10E-05 lb/hr)

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Pollutants shown in blue text are emitted only when burning Used Oil, but not when burning #2 Fuel Oil or Natural Gas

Facility: STAKER PARSON COMPANIES dba IDAHO MATERIALS AND CONSTRUCTION

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TAPs EL Screen - ALL SOURCES

Max Emissions of Any Pollutant from Drum Mix HMA Plant Fabric Filter, Tank Heater, Silo Fill/Load-out - Generator not included

A. Drum Mix Plant: 300 Tons/hour 1,000 Hours/year 300,000 Tons/year 5,000 Tons/day

Maximum emission for each pollutant from any fuel-burning option selected in "Facility Data" worksheet.

B. Tank Heater: 1.6000 MMBtu Rated 8,760 Hours/year

D. Include all emissions from Load-out/Silo Filling? Yes

Maximum emission for each pollutant for heater burning any fuel selected in "Facility Data" worksheet.

C1. IC Engine G1: 0.00 gal/hour 0 Hours/year #2 Fuel Oil 0 hrs/day

C2. IC Engine G2: 0.00 gal/hour 0 Hours/year #2 Fuel Oil 0 hrs/day

Pollutant	TOTAL of Max Emission Rates from A, B, & D (lb/hr)	TAPs Screening Emission Limit (EL) Increment[b] (lb/hr)	TAPs Emissions Exceed EL Increment?	Modeled?
non-PAH HAPs[e]				
Bromomethane (Methyl bromide[e])	2.04E-04	1.27	No	
2-Butanone (see Methyl Ethyl Ketone)				
Carbon disulfide[e]	5.19E-04	2	No	
Chloroethane (Ethyl chloride[e])	1.03E-04	176	No	
Chloromethane (Methyl chloride[e])	7.14E-04	6.867	No	
Cumene[e]	9.53E-04	16.3	No	
n-Hexane[e] (see Hexane[e])				
Methylene chloride (Dichloromethane[e])	6.65E-06	1.60E-03	No	
MTBE	0.00E+00			
Styrene[e]	2.00E-04	6.67	No	
Tetrachloroethene (Tetrachloroethylene[e])	6.67E-05	1.30E-02	No	
1,1,1-Trichloroethane (see Methyl chloroform[e])				
Trichloroethene (Trichloroethylene[e])	0.00E+00	17.93	No	
Trichlorofluoromethane	1.13E-05			
m-/p-Xylene[e] (added into Xylene[e])				
o-Xylene[e] (added into Xylene[e])				
Phenol[e,f]	8.35E-04	1.27	No	
Non-HAP Organic Compounds				
Methane	7.16E-01			

a) For HMA facilities subject to NSPS (40 CFR 60, Subpart I), PTE includes fugitive emissions of PM from load-out, silo filling & storage tank operations.

e) IDAPA Toxic Air Pollutant, 58.01.01.585 or .586

Facility: STAKER PARSON COMPANIES dba IDAHO MATERIALS AND CONSTRUCTION

5/25/2017 10:50 **Permit/Facility ID:** P-2017.0016 083-00193

TAPs MODELING

POUNDS PER HOUR - POINT AND PSEUDO-STACK SOURCES

Maximum Controlled Emissions of Any Pollutant from Drum Mix HMA Plant with Fabric Filter, Tank Heater, Generator, Silo Fill/Load-out

A. Drum Mix Plant: 300 Tons/hour 1,000 Hours/year 300,000 Tons/year 5,000 Tons/day
Maximum emission for each pollutant from any fuel-burning options selected on "Facility Data" worksheet. Fuels Selected = #2 Fuel Oil Used Oil Natural Gas LPG/Propane
B. Tank Heater: 1.0000 MMBtu Rated 8,760 Hours/year 24 hrs/day
Maximum emission for each pollutant for heater burning any fuel selected on "Facility Data" worksheet. Fuels Selected = #2 Fuel Oil Natural Gas
C1. IC Engine: 0.00 gal/hour 0 Hours/year IC Engine < 600hp #2 Fuel Oil 0 hrs/day
C2. IC Engine: 0.00 gal/hour 0 Hours/year IC Engine > 600hp #2 Fuel Oil 0 hrs/day

Pollutant	A Drum Dryer Max Emission Rate for Pollutant (lb/hr)	B Asphaltic Oil Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 * see note IC1< 600 bhp Generator Max Emission Rate for Pollutant (lb/hr)	C2 * see note IC2 > 600 bhp Generator Max Emission Rate for Pollutant (lb/hr)	D1 Silo Filling Emission Rate for Pollutant (lb/hr)	D2 Load-out Emission Rate for Pollutant (lb/hr)
PM (total)						
PM-10 (total)						
PM-2.5						
CO						
NOx						
SO_2						
VOC						
Lead						
HCl [e]	6.30E-02	0.00E+00	0	0		
Dioxins[e]						
2,3,7,8-TCDD	7.19E-12		0	0		
Total TCDD	3.18E-11		0	0		
1,2,3,7,8-PeCDD	1.06E-11		0	0		
Total PeCDD	7.53E-10		0	0		
1,2,3,4,7,8-HxCDD	1.44E-11	5.04E-12	0	0		
1,2,3,6,7,8-HxCDD	4.45E-11		0	0		
1,2,3,7,8,9-HxCDD	3.36E-11	5.55E-12	0	0		
Total HxCDD	4.11E-10		0	0		
1,2,3,4,6,7,8-Hp-CDD	1.64E-10	1.09E-10	0	0		
Total HpCDD	6.51E-10	1.46E-10	0	0		
Octa CDD	8.56E-10	1.17E-09	0	0		
Total PCDD[h]	2.71E-09	1.46E-09	0	0		
Furans[e]						
2,3,7,8-TCDF	3.32E-11		0	0		
Total TCDF	1.27E-10	2.41E-11	0	0		
1,2,3,7,8-PeCDF	1.47E-10		0	0		
2,3,4,7,8-PeCDF	2.88E-11		0	0		
Total PeCDF	2.88E-09	3.50E-12	0	0		
1,2,3,4,7,8-HxCDF	1.37E-10		0	0		
1,2,3,6,7,8-HxCDF	4.11E-11		0	0		
2,3,4,6,7,8-HxCDF	6.51E-11		0	0		
1,2,3,7,8,9-HxCDF	2.88E-10		0	0		
Total HxCDF	4.45E-10	1.46E-11	0	0		
1,2,3,4,6,7,8-HpCDF	2.23E-10		0	0		
1,2,3,4,7,8,9-HpCDF	9.25E-11		0	0		
Total HpCDF	3.42E-10	7.08E-11	0	0		
Octa CDF	1.64E-10	8.76E-11	0	0		
Total PCDF[h]	1.37E-09	2.26E-10	0	0		
Total PCDD/PCDF[h]	4.11E-09	1.68E-09	0	0		
Non-PAH HAPs						
Acetaldehyde[e]	4.45E-02		0	0		
Acrolein[e]	5.42E-03		0	0		
Benzene[e]	**1.34E-02**	**2.06E-06**	0	0	**1.34E-04**	**7.41E-05**
1,3-Butadiene[e]			0	0		
Ethylbenzene[e]	5.00E-02		0	0	9.65E-04	2.43E-03
Formaldehyde[e]	**1.06E-01**	**7.35E-05**	0	0	**2.88E-03**	**1.25E-04**
Hexane[e]	1.92E-01	1.76E-03	0	0	2.54E-03	1.30E-03
Isooctane	8.33E-03		0	0	7.87E-06	1.56E-05
Methyl Ethyl Ketone[e]	4.17E-03		0	0	9.90E-04	4.25E-04
Pentane[e]		2.55E-03	0	0		
Propionaldehyde[e]	2.71E-02		0	0		
Quinone[e]	3.33E-02		0	0		
Methyl chloroform[e]	1.00E-02		0	0		
Toluene[e]	6.04E-01	3.33E-06	0	0	1.57E-03	1.82E-03
Xylene[e]	4.17E-02		0	0	6.52E-03	1.05E-02
POM (7-PAH Group)	**1.88E-05**	**7.39E-07**		**0.00E+00**	**2.31E-05**	**1.58E-05**

Pollutant	A Drum Dryer Max Emission Rate for Pollutant (lb/hr)	B Asphaltic Oil Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 * see note IC1< 600 bhp Generator Max Emission Rate for Pollutant (lb/hr)	C2 * see note IC2 > 600 bhp Generator Max Emission Rate for Pollutant (lb/hr)	D Silo Filling Emission Rate for Pollutant (lb/hr)	D2 Load-out Emission Rate for Pollutant (lb/hr)
PAH HAPs						
2-Methylnaphthalene	**5.82E-03**	**2.35E-08**	0	0	**4.58E-04**	**2.78E-04**
3-Methylchloranthrene[e]	**0.00E+00**	**1.76E-09**	0	0		
Acenaphthene	**4.79E-05**	**3.87E-06**	0	0	**4.09E-05**	**3.04E-05**
Acenaphthylene	**7.53E-04**	**1.46E-06**	0	0	**1.22E-06**	**3.27E-06**
Anthracene	**1.06E-04**	**1.31E-06**	0	0	**1.13E-05**	**8.17E-06**
Benzo(a)anthracene[e]	**7.19E-06**	**1.76E-09**	0	0	**4.87E-06**	**2.22E-06**
Benzo(a)pyrene[e]	**3.36E-07**	**1.18E-09**	0	0	**0.00E+00**	**2.69E-07**
Benzo(b)fluoranthene[e]	**3.42E-06**	**7.30E-07**	0	0	**0.00E+00**	**8.87E-07**
Benzo(e)pyrene	**3.77E-06**	**0.00E+00**	0	0	**8.26E-07**	**9.11E-07**
Benzo(g,h,l)perylene	**1.37E-06**	**1.18E-09**	0	0	**0.00E+00**	**2.22E-07**
Benzo(k)fluoranthene[e]	**1.40E-06**	**1.76E-09**	0	0	**0.00E+00**	**2.57E-07**
Chrysene[e]	**6.16E-06**	**1.76E-09**	0	0	**1.83E-05**	**1.20E-05**
Dibenzo(a,h)anthracene[e]	**0.00E+00**	**1.18E-09**	0	0	**0.00E+00**	**4.32E-08**
Dichlorobenzene	**0.00E+00**	**1.18E-06**	0	0		
Fluoranthene	**2.09E-05**	**3.21E-07**	0	0	**1.30E-05**	**5.84E-06**
Fluorene	**3.77E-04**	**2.34E-07**	0	0	**8.78E-05**	**8.99E-05**
Indeno(1,2,3-cd)pyrene[e]	**2.40E-07**	**1.76E-09**	0	0	**0.00E+00**	**5.49E-08**
Naphthalene[e]	**2.23E-02**	**1.24E-04**	0	0	**1.58E-04**	**1.46E-04**
Perylene	**3.01E-07**	**0.00E+00**	0	0	**2.61E-06**	**2.57E-06**
Phenanthrene	**7.88E-04**	**3.58E-05**	0	0	**1.57E-04**	**9.46E-05**
Pyrene	**1.03E-04**	**2.34E-07**	0	0	**3.83E-05**	**1.75E-05**
Non-HAP Organic Compounds						
Acetone[e]	1.73E-01	0.00E+00	0	0	1.40E-03	4.05E-04
Benzaldehyde	2.29E-02	0.00E+00	0	0		
Butane	1.40E-01	2.06E-03	0	0		
Butyraldehyde	3.33E-02	0.00E+00	0	0		
Crotonaldehyde[e]	1.79E-02	0.00E+00	0	0		
Ethylene	1.46E+00	0.00E+00	0	0	2.79E-02	6.15E-03
Heptane	1.96E+00	0.00E+00	0	0		
Hexanal	2.29E-02	0.00E+00	0	0		
Isovaleraldehyde	6.67E-03	0.00E+00	0	0		
2-Methyl-1-pentene	8.33E-01	0.00E+00	0	0		
2-Methyl-2-butene	1.21E-01	0.00E+00	0	0		
3-Methylpentane	3.96E-02	0.00E+00	0	0		
1-Pentene	4.58E-01	0.00E+00	0	0		
n-Pentane	4.38E-02	0.00E+00	0	0		
Valeraldehyde[e]	1.40E-02	0.00E+00	0	0		
Metals						
Antimony[e]	3.75E-05	3.83E-05	0	0		
Arsenic[e]	**1.92E-05**	**9.63E-06**	0	0		
Barium[e]	1.21E-03	1.88E-05	0	0		
Beryllium[e]	**0.00E+00**	**2.03E-07**	0	0		
Cadmium[e]	**1.40E-05**	**2.90E-06**	0	0		
Chromium[e]	1.15E-03	6.17E-06	0	0		
Cobalt[e]	5.42E-06	4.39E-05	0	0		
Copper[e]	6.46E-04	1.28E-05	0	0		
Hexavalent Chromium[e]	**1.54E-05**	**1.81E-06**	0	0		
Manganese[e]	1.60E-03	2.19E-05	0	0		
Mercury[e]	5.42E-04	8.25E-07	0	0		
Molybdenum[e]	0.00E+00	5.74E-06	0	0		
Nickel[e]	**2.16E-03**	**6.17E-04**	0	0		
Phosphorus[e]	5.83E-03	6.90E-05	0	0		
Silver[e]	1.00E-04	0.00E+00	0	0		
Selenium[e]	7.29E-05	4.98E-06	0	0		
Thallium[e]	8.54E-07	0.00E+00	0	0		
Vanadium[e]	0.00E+00	2.32E-04	0	0		
Zinc[e]	1.27E-02	2.12E-04	0	0		

e) IDAPA Toxic Air Pollutant

Criteria Pollutant lb/hr emissions are maximum 1-hr averages
TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.
Pollutants shown in blue text are emitted only when burning Used Oil, but not when burning #2 Fuel Oil or Natural Gas

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSIS

MEMORANDUM

DATE: May 4, 2017

TO: Tom Burnham, Permit Writer, Air Program

FROM: Kevin Schilling, Stationary Source Modeling Coordinator, Air Program

PROJECT: P-2017.0016 PROJ 61861, Permit to Construct (PTC) for Idaho Materials and Construction Hot Mix Asphalt Plant

SUBJECT: Demonstration of Compliance with IDAPA 58.01.01.203.02 (NAAQS) and 203.03 (TAPs) as it relates to air quality impact analyses.

Contents

1.0 Summary

Staker Parson Companies doing business as Idaho Materials and Construction (IMC) submitted a Permit to Construct (PTC) application for operation of a stationary hot mix asphalt (HMA) plant in Twin Falls, Idaho. The PTC application was received on March 15, 2017. This memorandum provides a summary of the ambient air impact analyses performed by DEQ in support of the PTC application in the context of requirements set forth in the Idaho Administrative Procedures Act 58.01.01 (Idaho Air Rules).

Project-specific air quality analyses were performed by DEQ using atmospheric dispersion modeling of estimated emissions associated with the facility. These analyses demonstrated the facility would not cause or significantly contribute to a violation of any National Ambient Air Quality Standard (NAAQS) or Toxic Air Pollutant (TAP) allowable ambient increment, as required by the Idaho Administrative Procedures Act 58.01.01.203.02 and 203.03 (Idaho Air Rules Section 203.02 and 203.03).

DEQ's analyses summarized by this memorandum addressed only the rules, policies, methods, and data pertaining to the air impact analyses. This review did not evaluate compliance with other rules or analyses that do not pertain to the air impact analyses. Evaluation of emissions estimates was the responsibility of the permit writer and is addressed in the main body of the DEQ Statement of Basis, and emissions calculation methods were not evaluated in this modeling review memorandum.

The submitted information, in combination with DEQ's air impact analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data (review of emissions estimates was addressed by the DEQ permit writer); 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed either a) that estimated potential/allowable emissions are at a level defined as below regulatory concern (BRC) and do not require a NAAQS compliance demonstration; b) that predicted pollutant concentrations from emissions associated with the project as modeled were below Significant Impact Levels (SILs) or other applicable regulatory thresholds; or c) that predicted pollutant concentrations from emissions associated with the project as modeled, when appropriately combined with co-contributing sources and background concentrations, were below applicable NAAQS at ambient air locations where and when the project has a significant impact; 5) showed that TAP emissions increases associated with the project will not result in increased ambient air impacts exceeding allowable TAP increments.

Table 1 presents key assumptions and results to be considered in the development of the permit.

Idaho Air Rules require air impact analyses be conducted in accordance with methods outlined in 40 CFR 51, Appendix W *Guideline on Air Quality Models* (Appendix W). Appendix W requires that air quality impacts be assessed using atmospheric dispersion models with emissions and operations representative of design capacity or as limited by a federally enforceable permit condition. The submitted information and analyses performed by DEQ demonstrated to the satisfaction of the Department that operation of the proposed facility will not cause or significantly contribute to a violation of any ambient air quality standard, provided the key conditions in Table 1 are representative of facility design capacity or operations as limited by a federally enforceable permit condition. The DEQ permit writer should use Table 1 and other information presented in this memorandum to generate appropriate permit provisions/restrictions to assure that emissions rates higher than those used in the air impact analyses do not occur.

Table 1. KEY CONDITIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
Maximum HMA throughput does not exceed 300 ton/hour, 5,000 ton/day, and 300,000 ton/year.	Short-term and annual modeling was performed assuming these rates.
Co-contributing emissions sources such as other HMA plants, concrete batch plants, or rock crushing plants will not locate on the plant property and within 1,000 feet of the drum dryer stack of the HMA plant, except as noted below for a rock crushing plant.	Emissions are considered co-contributing if they occur within 1,000 feet (305 meters) of each other. Once the HMA plant is established at a specific site, that facility is not responsible for controlling other facilities from moving in nearby, provided they are not on the same property. Neighboring facilities would be required to account for the HMA impacts for their permitting analyses.
DEQ Modeling staff contend that NAAQS compliance is assured for an HMA plant operating simultaneously (both within a given day) with a co-contributing crushing plant, provided HMA daily throughput for that day is limited to half that normally allowed and the annual actual throughput of the rock crushing plant is less than 500,000 ton/year.	Decreased HMA throughput will offset potential impacts of a nearby crushing plant.
Fugitive emissions from vehicle traffic are controlled to a high degree.	Emissions from vehicle traffic on unpaved surfaces was assumed to be minimal and accounted for in the background concentrations used in the analyses.
Emissions rates for applicable averaging periods are not greater than those used in the modeling analyses, as listed in this memorandum.	Compliance has not been demonstrated for emissions rates greater than those used in the modeling analyses.
Stack height for the drum dryer is as listed in this memorandum or higher.	NAAQS compliance is still assured if actual stack heights are greater than those listed in this memo.
NAAQS compliance is assured provided stack parameters of exhaust temperatures and flow rates are not less than about 75 percent of values listed in this memorandum.	Higher temperatures and flow rates increase plume rise, allowing the plume to disperse to a larger degree before impacting ground level.

2.0 Background Information

This section provides background information applicable to the project and the site at the facility location. It also provides a brief description of the applicable air impact analyses requirements for the project.

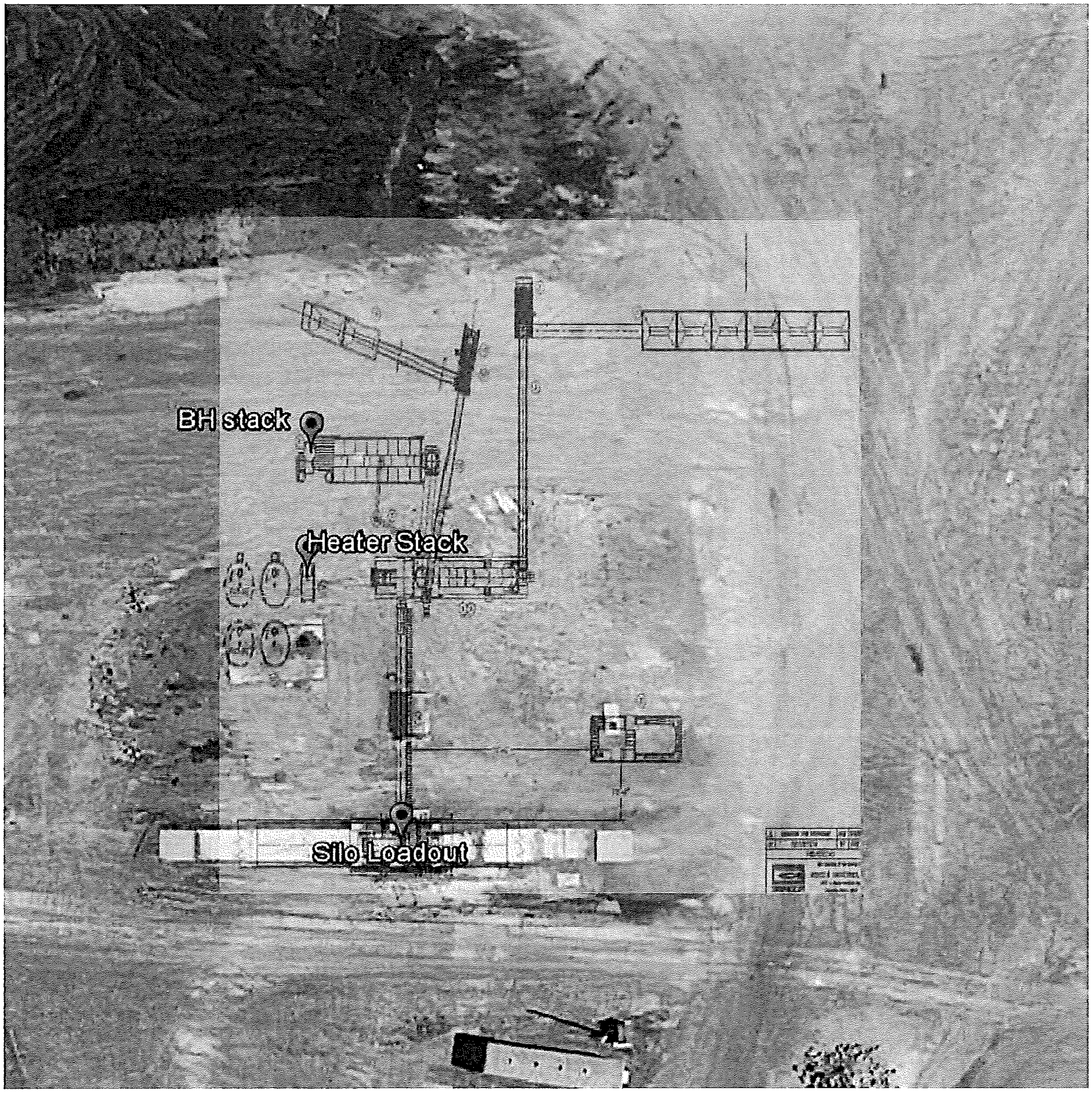
2.1 Project Description, Proposed Location, and Area Classification

The HMA plant will be a stationary facility, located at 1310 Addison Ave. West, Twin Falls, Idaho. The location of air pollutant-emitting equipment on the site is critical to NAAQS compliance assurance. Modeled impacts are greatly affected by the predominant wind direction and the distance between the pollutant release point and the ambient air boundary (typically the property boundary is used as the ambient air boundary).

The applicant provided DEQ with an aerial photograph of the site with locations of pollutant-emitting equipment superimposed. Figure 1 shows the site with the ambient air boundary and Figure 2 provides equipment locations.

Figure 1: Twin Falls site for proposed HMA plant. The bold red line is the boundary to ambient air.

Figure 2: Pollutant-emitting equipment locations at the Twin Falls site.



2.2 Air Impact Analyses Required for All Permits to Construct

Criteria Pollutant and TAP Impact Analyses for a PTC are addressed in Idaho Air Rules Sections 203.02 and 203.03:

No permit to construct shall be granted for a new or modified stationary source unless the applicant shows to the satisfaction of the Department all of the following:

02. NAAQS. The stationary source or modification would not cause or significantly contribute to a violation of any ambient air quality standard.

***03. Toxic Air Pollutants.** Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

Atmospheric dispersion modeling, using computerized simulations, is used to demonstrate compliance with both NAAQS and TAPs. Idaho Air Rules Section 202.02 states:

***Estimates of Ambient Concentrations.** All estimates of ambient concentrations shall be based on the applicable air quality models, data bases, and other requirements specified in 40 CFR 51 Appendix W (Guideline on Air Quality Models).*

2.3 Significant Impact Level and Cumulative NAAQS Impact Analyses

The Significant Impact Level (SIL) analysis for a proposed new facility or facility modification involves modeling estimated criteria air pollutant emissions from the facility or modification to determine the potential impacts to ambient air. Air impact analyses are required by Idaho Air Rules to be conducted according to methods outlined in 40 CFR 51, Appendix W (Guideline on Air Quality Models). Appendix W requires analyses based on emissions and operations representative of design capacity or as limited by a federally enforceable permit condition.

A facility or modification is considered to have a significant impact on air quality if maximum modeled impacts to ambient air exceed the established SIL listed in Idaho Air Rules Section 006 (referred to as a significant contribution in Idaho Air Rules) or as incorporated by reference as per Idaho Air Rules Section 107.03.b. Table 2 lists the applicable SILs.

If modeled maximum pollutant impacts to ambient air from the emissions sources associated with a new facility or modification exceed the SILs, then a cumulative NAAQS impact analysis is necessary to demonstrate compliance with NAAQS and Idaho Air Rules Section 203.02.

A cumulative NAAQS impact analysis for attainment area pollutants involves assessing ambient impacts (typically the design values consistent with the form of the standard) from facility-wide emissions, and emissions from any nearby co-contributing sources. A DEQ-approved background concentration value, appropriate for the criteria pollutant/averaging-period at the facility location and the area of significant impact, is then added to the modeled result. The resulting pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 2. Table 2 also lists SILs and specifies the modeled design value that must be used for comparison to the NAAQS. NAAQS compliance is evaluated on a receptor-by-receptor basis for the modeling domain.

Table 2. APPLICABLE REGULATORY LIMITS

Pollutant	Averaging Period	Significant Impact Levels[a] ($\mu g/m^3$)[b]	Regulatory Limit[c] ($\mu g/m^3$)	Modeled Design Value Used[d]
PM_{10}[e]	24-hour	5.0	150[f]	Maximum 6th highest[g]
$PM_{2.5}$[h]	24-hour	1.2	35[i]	Mean of maximum 8th highest[j]
	Annual	0.3	12[k]	Mean of maximum 1st highest[l]
Carbon monoxide (CO)	1-hour	2,000	40,000[m]	Maximum 2nd highest[n]
	8-hour	500	10,000[m]	Maximum 2nd highest[n]
Sulfur Dioxide (SO_2)	1-hour	3 ppb[o] (7.8 $\mu g/m^3$)	75 ppb[p] (196 $\mu g/m^3$)	Mean of maximum 4th highest[q]
	3-hour	25	1,300[m]	Maximum 2nd highest[n]
	24-hour	5	365[m]	Maximum 2nd highest[n]
	Annual	1.0	80[r]	Maximum 1st highest[n]
Nitrogen Dioxide (NO_2)	1-hour	4 ppb (7.5 $\mu g/m^3$)	100 ppb[s] (188 $\mu g/m^3$)	Mean of maximum 8th highest[t]
	Annual	1.0	100[r]	Maximum 1st highest[n]
Lead (Pb)	3-month[u]	NA	0.15[r]	Maximum 1st highest[n]
	Quarterly	NA	1.5[r]	Maximum 1st highest[n]
Ozone (O_3)	8-hour	40 TPY VOC[v]	70 ppb[w]	Not typically modeled

a. Idaho Air Rules Section 006 (definition for significant contribution) or as incorporated by reference as per Idaho Air Rules Section 107.03.b.
b. Micrograms per cubic meter.
c. Incorporated into Idaho Air Rules by reference, as per Idaho Air Rules Section 107.
d. The maximum 1st highest modeled value is always used for the significant impact analysis unless indicated otherwise. Modeled design values are calculated for each ambient air receptor.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
f. Not to be exceeded more than once per year on average over 3 years.
g. Concentration at any modeled receptor when using five years of meteorological data.
h. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
i. 3-year mean of the upper 98th percentile of the annual distribution of 24-hour concentrations.
j. 5-year mean of the 8th highest modeled 24-hour concentrations at the modeled receptor for each year of meteorological data modeled. For the SIL analysis, the 5-year mean of the 1st highest modeled 24-hour impacts at the modeled receptor for each year.
k. 3-year mean of annual concentration.
l. 5-year mean of annual averages at the modeled receptor.
m. Not to be exceeded more than once per year.
n. Concentration at any modeled receptor.
o. Interim SIL established by EPA policy memorandum.
p. 3-year mean of the upper 99th percentile of the annual distribution of maximum daily 1-hour concentrations.
q. 5-year mean of the 4th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of 1st highest modeled 1-hour impacts for each year is used.
r. Not to be exceeded in any calendar year.
s. 3-year mean of the upper 98th percentile of the annual distribution of maximum daily 1-hour concentrations.
t. 5-year mean of the 8th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of maximum modeled 1-hour impacts for each year is used.
u. 3-month rolling average.
v. An annual emissions rate of 40 ton/year of VOCs is considered significant for O_3.
w. Annual 4th highest daily maximum 8-hour concentration averaged over three years.

If the cumulative NAAQS impact analysis indicates a violation of the standard, the permit may not be issued if the proposed project has a significant contribution (exceeding the SIL) to the modeled violation. This evaluation is made specific to both time and space. If the SIL analysis indicates the facility/modification has impacts exceeding the SIL, the facility might not have a significant contribution to violations if impacts are below the SIL at the specific receptors showing the violations during the time periods when modeled violations occurred.

Compliance with Idaho Air Rules Section 203.02 is generally demonstrated if: a) all modeled impacts of the SIL analysis are below the applicable SIL or other level determined to be inconsequential to NAAQS compliance; or b) modeled design values of the cumulative NAAQS impact analysis (modeling all emissions from the facility and co-contributing sources, and adding a background concentration) are less than applicable NAAQS at receptors where impacts from the proposed facility/modification exceeded the SIL or other identified level of consequence; or c) if the cumulative NAAQS analysis showed NAAQS violations, the impact of proposed facility/modification to any modeled violation was inconsequential (typically assumed to be less than the established SIL) for that specific receptor and for the specific modeled time when the violation occurred.

2.4 Toxic Air Pollutant Analyses

Emissions of toxic substances are generally addressed by Idaho Air Rules Section 161:

> *Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation.*

Permitting requirements for TAPs from new or modified sources are specifically addressed by Idaho Air Rules Section 203.03 and require the applicant to demonstrate to the satisfaction of DEQ the following:

> *Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

Per Section 210, if the total project-wide emissions increase of any TAP associated with a new source or modification exceeds screening emission levels (ELs) of Idaho Air Rules Section 585 or 586, then the ambient impact of the emissions increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of Idaho Air Rules Section 585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of Idaho Air Rules Section 586, then compliance with TAP requirements has been demonstrated.

Idaho Air Rules Section 210.20 states that if TAP emissions from a specific source are regulated by the Department or EPA under 40 CFR 60, 61, or 63, then a TAP impact analysis under Section 210 is not required for that TAP.

3.0 Analytical Methods and Data

This section describes the methods and data used in air impact analyses to demonstrate compliance with applicable air quality impact requirements.

3.1 Emission Source Data

Data needed to calculate criteria pollutant and TAP emissions rates for the IMC HMA plant was provided by IMC's Environmental Advisor for various applicable averaging periods. DEQ's HMA emissions calculation spreadsheet as used to calculate emissions, given the specified equipment and requested operational rates. Review and approval of estimated emissions was the responsibility of the DEQ permit writer and is not addressed in this modeling memorandum. DEQ's modeling analyses assured that the application's potential emissions rates were properly used in the model. The rates listed represent the maximum allowable rate as averaged over the specified period.

All modeled criteria air pollutant and TAP emissions rates were equal to or greater than the facility's emissions as calculated in the HMA emissions spreadsheet.

3.1.1 Criteria Pollutant Emissions Rates and Modeling Applicability

Table 3 lists criteria pollutant emissions rates used in the DEQ air impact modeling analyses for the proposed HMA plant production rate, proposed operational configuration, and for all applicable averaging periods. Attachment 1 provides additional details of DEQ emissions calculations used in the modeling analyses.

Table 3. EMISSIONS USED IN DEQ ANALYSES

Emissions Point in Model	UTM Coordinates Easting (meters)	UTM Coordinates Northing (meters)	Pollutant	Averaging Period	Emissions Rate (pound/hour)[a]
DRYER – drum dryer/mixer - emissions controlled by a baghouse - emissions include silo filling emissions (SILO) that are captured and routed back through the drum dryer.	704347	4715818	$PM_{2.5}$	24-hour	4.768[b]
				Annual	0.7838[c]
			PM_{10}	24-hour	4.914[b]
			NOx	1-hour	16.50
				Annual	1.884[c]
			SO_2	1-hour	26.7
SILO – asphalt storage silo			Emissions captured and routed back to drum dryer		
LOADOUT – asphalt loadout	704358	4715775	$PM_{2.5}$	24-hour	0.1087[b]
				Annual	0.01788[c]
			PM_{10}	24-hour	0.1087[b]
HEATER – asphalt oil heater	704348	4715804	$PM_{2.5}$	24-hour	0.01124[b]
				Annual	0.01124[c]
			PM_{10}	24-hour	0.01679[b]
			NOx	1-hour	0.1751
				Annual	0.1751[c]
			SO_2	1-hour	0.00155
LOADCONV – aggregate handling by frontend loader and conveyor transfers	704370	4715818	$PM_{2.5}$	24-hour	0.1089[b,d]
				Annual	0.01789[c,d]
			PM_{10}	24-hour	0.7191[b,d]
SCREEN – scalping screen	704371	4715828	$PM_{2.5}$	24-hour	0.002600[b]
				Annual	0.0004274[c]
			PM_{10}	24-hour	0.1740[b]

a. Pound/hour emissions rate used in modeling analyses for specified averaging periods.
b. Calculated by multiplying the daily throughput or daily operational hours by the emissions factor, then dividing by 24.
c. Emissions rate is equal to annual emissions divided over 8,760 hour/year.
d. Emissions are varied in the model according to wind speed category. Emissions listed are based on a 10 mph wind speed.

Fugitive particulate emissions from frontend loader handling of aggregate materials and three conveyor transfers for the HMA plant were designated as volume source emissions point LOADCONV in the model. Two transfers were included for the frontend loader source: 1) transfer of aggregate from truck unloading or other transfer means to a storage pile; 2) transfer of aggregate from the storage pile to a hopper. Three transfers were included with this source for aggregate conveyors as indicated by the applicant. Emissions rates for LOADCONV are a function of wind speed and were varied in the model with wind speed for each hour modeled. Attachment 1 provides details on emissions calculations.

Pollutant-Specific Applicability of Impact Analyses

DEQ's regulatory interpretation policy of permit exemption provisions of Idaho Air Rules is that: "A DEQ NAAQS compliance assertion will not be made by the DEQ modeling group for specific criteria pollutants having a project emissions increase below BRC levels, provided the proposed project would have qualified for a Category I Exemption for BRC emissions quantities except for the emissions of another criteria pollutant." Idaho Air Rules Section 220.01.a.i also states that uncontrolled potential to emit (PTE) must not exceed 100 ton/year to qualify for a PTC exemption. The DEQ BRC interpretation policy clarified that this exemption criterion is not applicable when evaluating whether a NAAQS impact analyses is required. A permit will be issued limiting PTE below 100 ton/year, thereby negating the need to maintain calculated uncontrolled PTE under 100 ton/year.

The submitted emissions inventory asserts that facility-wide PTE emissions of Pb are below BRC levels, as listed in Table 4. Therefore, a NAAQS compliance demonstration for per Idaho Air Rules Section 203.02 is not required for permit issuance.

Table 4. CRITERIA POLLUTANT NAAQS COMPLIANCE DEMONSTRATION APPLICABILITY

Criteria Pollutant	BRC Level (ton/year)	Applicable Facility Wide PTE Emissions (ton/year)	NAAQS Compliance Demonstration Required?
PM_{10}[a]	1.5	3.5	Yes
$PM_{2.5}$[b]	1.0	3.4	Yes
Carbon Monoxide (CO)	10.0	19.9	Yes
Sulfur Dioxide (SO_2)	4.0	13.4	Yes
Nitrogen Oxides (NOx)	4.0	9.0	Yes
Lead (Pb)	0.06	0.0023	No
Ozone as VOC or NOx	4.0	4.8	Yes

a. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.

Exclusion from Impact Analyses by Modeling Thresholds

Site-specific air impact modeling analyses may not be necessary for some pollutants, even where such emissions do not qualify for the BRC exemption. DEQ has developed modeling applicability thresholds, below which a site-specific modeling analysis is not required. DEQ generic air impact modeling analyses that were used to develop the modeling thresholds provide a conservative SIL analysis for projects with emissions below identified threshold levels. Project-specific modeling applicability thresholds are provided in the *Idaho Air Modeling Guideline*[2]. These thresholds were based on assuring an ambient impact of less than the established SIL for specific pollutants and averaging periods.

If project-specific total emissions rate increases of a pollutant are below Level I Modeling Thresholds, then project-specific air impact analyses are not necessary for permitting. Use of Level II Modeling Thresholds are conditional, requiring DEQ approval. DEQ approval is based on dispersion-affecting characteristics of the emissions sources such as stack height, stack gas exit velocity, stack gas temperature, distance from sources to ambient air, presence of elevated terrain, and potential exposure to sensitive public receptors. DEQ determined Level II Modeling Thresholds were appropriate for CO, NOx, and SO2 because emissions occur almost exclusively from the drum dryer, which has very good dispersion characteristics (elevated release, high temperature and high volume exhaust, and a large distance between the source and the ambient air boundary).

Emissions of CO from the IMC HMA were not modeled to evaluate impacts to ambient air because facility-wide emissions were below the DEQ Level II Modeling Thresholds of 175 pounds/hour for CO.

Annual NOx estimated emissions of 9.0 ton/year were below the 14 ton/year Level II Modeling Threshold, but 1-hour NOx emissions of 17 pound/hour exceeded the 2.4 pound/hour Level II threshold.

Ozone (O_3) differs from other criteria pollutants in that it is not typically emitted directly into the atmosphere. O_3 is formed in the atmosphere through reactions of VOCs, NOx, and sunlight. Atmospheric dispersion models used in stationary source air permitting analyses (see Section 3.3.3) cannot be used to estimate O_3 impacts resulting from VOC and NOx emissions from an industrial facility. O_3 concentrations resulting from area-wide emissions are predicted by using more complex airshed models such as the Community Multi-Scale Air Quality (CMAQ) modeling system. Use of the CMAQ model is very resource intensive and DEQ asserts that performing a CMAQ analysis for a particular permit application is not typically a reasonable or necessary requirement for air quality permitting.

Addressing secondary formation of O_3 has been somewhat addressed in EPA regulation and policy. As stated in a letter from Gina McCarthy of EPA to Robert Ukeiley, acting on behalf of the Sierra Club (letter from Gina McCarthy, Assistant Administrator, United States Environmental Protection Agency, to Robert Ukeiley, January 4, 2012):

> *. . . footnote 1 to sections 51.166(I)(5)(I) of the EPA's regulations says the following: "No de minimis air quality level is provided for ozone. However, any net emission increase of 100 tons per year or more of volatile organic compounds or nitrogen oxides subject to PSD would be required to perform an ambient impact analysis, including the gathering of air quality data."*
>
> *The EPA believes it unlikely a source emitting below these levels would contribute to such a violation of the 8-hour ozone NAAQS, but consultation with an EPA Regional Office should still be conducted in accordance with section 5.2.1.c. of Appendix W when reviewing an application for sources with emissions of these ozone precursors below 100 TPY."*

Allowable emissions estimates of VOCs and NOx are below the 100 tons/year threshold, and DEQ determined it was not appropriate or necessary to require a quantitative source specific O_3 impact analysis.

Secondary Particulate Formation

The impact from secondary particulate formation resulting from emissions of NOx, SO_2, and/or VOCs was assumed by DEQ to be negligible on the basis of the magnitude of emissions and the short distance from emissions sources to modeled receptors where maximum PM_{10} and $PM_{2.5}$ impacts would be anticipated.

3.1.2 Toxic Air Pollutant Emissions Rates

The emissions inventory identified potential increases of several TAPs could exceed screening emissions levels (ELs). Table 5 lists those TAPs having potential emissions exceeding ELs Idaho Air Rules Sections 585 or 586. Potential increases in emissions of other TAPs identified in the application were all less than applicable ELs. Table 5 lists modeled emissions of TAPs.

Emissions rates input to the model were 1,000 times greater than those listed in Table 5. This was done because AERMOD output resolution is limited to 1 E-5 $\mu g/m^3$, which is near the AACC of several Section 586 TAPs. Correct modeled impacts were obtained by dividing the model output by 1,000, as model output varies linearly with emissions rates.

Table 5. MODELED TAP EMISSIONS RATES

TAP	Averaging Period	Emissions Rates for Listed Sources (Pound/Hour)[a]			
		Drum Dryer[b] (DRYR)	Silo Filling[b] (DRYR)	Oil Tank Heater (HEAT)	Asphalt Loadout (LOUT)
Acetaldehyde	Annual	4.45E-2			
Benzene	Annual	1.34E-2	1.34E-4	2.06E-6	7.41E-5
Formaldehyde	Annual	1.06E-1	2.88E-3	7.35E-5	1.25E-4
PAH[c]	Annual	2.23E-2	1.58E-4	1.24E-4	1.46E-4
POM[d]	Annual	1.88E-5	2.31E-5	7.39E-7	1.58E-5
Arsenic	Annual	1.92E-5		9.63E-6	
Cadmium	Annual	1.40E-5		2.90E-6	
Hexavalent Chromium	Annual	1.54E-5		1.81E-6	
Nickel	Annual	2.16E-3		6.17E-4	
Hydrochloric Acid	24-hour	6.30E-2			
Quinone	24-hour	3.33E-2			

a. For the 24-hour averaging period, emissions are maximum daily allowable emissions divided by 24 hour/day. For the annual averaging period, emissions are maximum allowable annual emissions divided over 8,760 hour/year.
b. Emissions from silo filling are captured, channeled back to the drum dryer, and emitted from the drum dryer stack. Modeled emissions from DRYR are the sum of Drum Dryer emissions and Silo Filling emissions.
c. Polyaromatic Hydrocarbons. Naphthalene was the PAH with the highest emissions rate.
d. Polycyclic Organic Matter.

3.1.3 Emissions Release Parameters

Table 6 provides emissions release parameters of modeled sources in the impact analyses, including stack height, stack diameter, exhaust temperature, and exhaust velocity. Additional details are provided in Attachment 1.

Table 6. EMISSIONS RELEASE PARAMETERS					
Release Point /Location	**Source Type**	**Stack Height (meters)**	**Modeled Diameter (meters)**	**Stack Gas Temp. (Kelvin)**	**Stack Gas Flow Velocity (meters/second)**
DRYER	Point	9.8	1.37	478	9.22
HEATER	Point	2.4	0.27	614	3.68
LOADOUT	Point	3.5	3.0	346	0.1
Volume Sources					
Release Point /Location	**Source Type**	**Release Height (meters)**	**Initial Horizontal Dispersion Coefficient σ_{y0} (meters)**	**Initial Vertical Dispersion Coefficient σ_{z0} (meters)**	
LOADCONV	Volume	2.5	4.65	1.16	
SCREEN	Volume	3.0	0.70	0.70	

Asphalt loadout was modeled as a point source, rather than volume sources, to account for thermal buoyancy of the emissions plume. Release parameters for asphalt loadout were based on the following:

- Release point of asphalt loadout operations was set to correspond to the top of a truck bed.
- Stack diameter of 3.0 meters was used to approximately correspond to a typical silo. Model-calculated stack tip downwash will account for downwash affects potentially caused by the silo.
- Stack gas temperature of 346K was calculated by assuming the gas temperature would be half that of the default asphalt temperature of 325°F (1/2 of 325° F = 163° F = 346 K).
- Flow velocity of 0.1 m/sec was used to establish a reasonably conservative total flow from the source of 1,500 actual cubic feet per minute, caused by convection.

3.2 Background Concentrations

Background concentrations are used in the cumulative NAAQS impact analyses to account for impacts from sources not explicitly modeled. Table 7 lists reasonably conservative background concentrations for the site location.

Background concentration values for most pollutants were obtained for the site by using a background concentration tool developed by the Northwest International Air Quality Environmental Science and Technology Consortium (NW AIRQUEST) and provided through Washington State University (located at http://lar.wsu.edu/nw-airquest/lookup.html). The tool uses regional scale modeling of pollutants in Washington, Oregon, and Idaho, with model results adjusted by available monitoring data (data for 2009-2011).

The NW AIRQUEST 24-hour $PM_{2.5}$ background value for the site was 30 $\mu g/m^3$. DEQ monitoring staff expressed concern that the NW AIRQUEST value was unreasonably high for the area. However, DEQ began operating a special purpose $PM_{2.5}$ Beta Attenuation Monitor (BAM) in April 2016 at 650 Addison Ave., Twin Falls. This location is approximately 2.4 miles east of the proposed IMC site. DEQ modeling staff analyzed monitoring data from April 1, 2016 to March 31, 2017. The 24-hour averaged $PM_{2.5}$

design value (the 98th percentile, which translates to the 7th highest 24-hour value after considering days voided from the data for various quality assurance/control reasons) was 18.6 $\mu g/m^3$.

Table 7. BACKGROUND CONCENTRATIONS		
Pollutant	**Averaging Period**	**Background Concentration ($\mu g/m^3$)[a]**
PM_{10}[b]	24-hour	74
$PM_{2.5}$[c]	24-hour	18.6
	Annual	10
Nitrogen dioxide (NO_2)	1-hour	60.2
	Annual	11.7
Sulfur dioxide (SO_2)	1-hour	9.9

a. Micrograms per cubic meter.
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.

3.3 NAAQS Impact Modeling Methodology

This section describes the modeling methods used by DEQ to demonstrate preconstruction compliance with applicable air quality standards.

3.3.1 General Overview of Analyses

DEQ performed site-specific analyses that were reasonably representative of the proposed HMA plant, and the results demonstrated compliance with applicable air quality standards to DEQ's satisfaction, provided the facility is constructed and operated as described in the application and in this memorandum.

Table 8 provides a brief description of parameters used in the modeling analyses.

Table 8. MODELING PARAMETERS		
Parameter	**Description/Values**	**Documentation/Addition Description**
General Facility Location	Twin Falls	All locations not within non-attainment areas.
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 16216r
Meteorological Data	Twin Falls surface Boise upper air	See Section 3.3.5
Terrain	considered	Used National Elevation Database (NED) for elevations
Building Downwash	Not Considered	No substantial structures were identified in the application.
Receptor Grid	Grid 1	10-meter spacing out 50 meters
	Grid 2	25-meter spacing out 150 meters
	Grid 3	50-meter spacing out 200 meters
	Grid 4	100-meter spacing out 500 meters
	Grid 5	500-meter spacing out 3,000 meters

3.3.2 Modeling protocol and Methodology

A modeling protocol was not submitted to DEQ prior to the application because DEQ performed the air impact modeling analyses. Site-specific modeling was generally conducted using data and methods described in the *State of Idaho Air Quality Modeling Guideline*.[2]

3.3.3 Model Selection

Idaho Air Rules Section 202.02 requires that estimates of ambient concentrations be based on air quality models specified in 40 CFR 51, Appendix W (Guideline on Air Quality Models). The refined, steady state, multiple source, Gaussian dispersion model AERMOD was promulgated as the replacement model for ISCST3 in December 2005. AERMOD retains the single straight line trajectory of ISCST3, but includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

AERMOD version 16216r was used for the modeling analyses to evaluate impacts of the facility. This version was the current version at the time the application was received by DEQ.

3.3.4 Data and Parameters used for Modeling 1-Hour NO_2 with ARM2

DEQ used the Ambient Ratio Method 2 (ARM2) to account for NO to NO_2 conversion in the atmosphere. Default values of 0.5 for a minimum NO_2:NOx ratio and 0.9 for a maximum NO_2:NOx ratio were used.

3.3.5 Meteorological Data

DEQ air impact analyses used meteorological data processed from Twin Falls airport surface data and Boise airport upper air meteorological data for years 2008 through 2012. DEQ determined these data were reasonably representative for the IMC site in Twin Falls.

3.3.6 Effects of Terrain on Modeled Impacts

Ambient air impact analyses used terrain data extracted from United States Geological Survey (USGS) National Elevation Dataset (NED) files in the WGS84 datum (approximately equal to the NAD83 datum).

The terrain preprocessor AERMAP Version 11103 was used by W&A to extract the elevations from the NED files and assign them to receptors in the modeling domain in a format usable by AERMOD. AERMAP also determined the hill-height scale for each receptor. The hill-height scale is an elevation value based on the surrounding terrain which has the greatest effect on that individual receptor. AERMOD uses those heights to evaluate whether the emissions plume has sufficient energy to travel up and over the terrain or if the plume will travel around the terrain.

3.3.7 Facility Layout

The applicant provided an aerial photograph with proposed equipment locations identified. This is shown in Figure 2 of this memorandum. Model results are highly dependent on the location of emissions sources at the site. Compliance with applicable standards has not been demonstrated for alternate locations of emissions sources.

3.3.8 Effects of Building Downwash on Modeled Impacts

No substantial structures in the immediate vicinity of the proposed HMA plant were identified in the application. Downwash effects from equipment or other minor structures at the site were not accounted for because the equipment is porous with regard to wind, thereby minimizing downwash effects

3.3.9 Ambient Air Boundary

Ambient air is defined in Section 006 of the Idaho Air Rules as "that portion of the atmosphere, external to buildings, to which the general public has access." Ambient air was considered areas external to the property boundary identified by the applicant. It was assumed that reasonable measures will be taken to preclude public access to the site.

3.3.10 Receptor Network

Table 8 describes the receptor grid used in the air impact modeling analyses. The receptor grid met the minimum recommendations specified in the *Idaho Air Quality Modeling Guideline*[2] and DEQ determined that it was adequate to resolve maximum modeled impacts. A receptor grid extending out beyond 3,000 meters from the facility boundary was not necessary for these analyses because pollutants are emitted from relatively short stacks that will cause maximum impacts to be located very close to the source, typically at or very close to the ambient air boundary.

3.3.12 Crucial HMA Plant Characteristics Affecting Air Quality Impacts

Table 11 lists characteristics of the HMA plant that are critical to the NAAQS and TAPs compliance demonstrations.

Table 11. IMPORTANT CHARACTERISTIC OF HMA PLANT USED IN DEQ ANALYSES

Parameter	Value or Description
HMA Throughput Rates	300 ton/hr, 5,000 ton/day, 300,000 ton/yr
Co-Contributing Sources	A co-contributing emissions sources will not locate on the plant property and within 1,000 feet of emissions points of the HMA, except as noted below for a rock crushing plant. A rock crushing plant could be operated at the site provided it is not operated during any day when the HMA plant is operated and annual throughput is less than 500,000 ton/yr. Alternatively, a rock crusher could be operated simultaneously (both operating in a given day) with the HMA plant provided the HMA throughput for that day does not exceed a value of half that otherwise allowed.
Drum Dryer	Drum dryer fueled by natural gas, propane, diesel, or used oil with a baghouse for emissions control.
Electrical Power	Line power will be used. No generators will be used to power the plant.
Dryer Stack Parameters	Stack height ≥32 ft, stack diameter ≈54 in, gas temp ≥ 400° F, flow velocity ≥30 ft/sec.
Asphalt Silo Filling	Emissions are captured and routed back into the drum dryer.
Conveyor Transfers	≤3 transfers for any given quantity of material processed. Emissions controlled by 90%.
Scalping Screen	≤1 screen for any given quantity of material processed. Emissions controlled by 90%.
Frontend Loader Transfers	≤2 transfers for any given quantity of material processed. Typically involves: 1) aggregate to storage pile; 2) aggregate from pile to hopper.
Seasonal Restriction	None were assessed.

4.0 Impact Modeling Results

4.1 Results for NAAQS Cumulative Impact Level Analyses and TAP Impact Analyses

Table 12. provides results for the air impact analyses of criteria pollutants.

Table 12. RESULTS FOR CUMULATIVE NAAQS IMPACT ANALYSES					
Pollutant	**Averaging Period**	**Modeled Design Concentration ($\mu g/m^3$)[a]**	**Background Concentration ($\mu g/m^3$)**	**Total Impact ($\mu g/m^3$)**	**NAAQS ($\mu g/m^3$)**
$PM_{2.5}$[b]	24-hour	10.28[g]	18.6	28.9[g]	35
	Annual	0.34[h]	10	10.3[h]	12
PM_{10}[c]	24-hour	34.7[i]	74	108.7[i]	150
NO_2[d]	1-hour	69.2[g]	60.2	129.4[g]	188
	Annual	0.70	11.7	12.4	100
SO_2[e]	1-hour	126.4[j]	9.9	135.9[j]	196
	3-hour	XXX.XX[k]	9.9	XXX.XX[k]	1,300

a. Micrograms/cubic meter
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
d. Nitrogen dioxide.
e. Sulfur dioxide.
f. Carbon Monoxide.
g. Maximum of 5-year means (or a lesser averaging period if less than 5 years of meteorological data were used in the analyses) of 8th highest modeled concentrations for each year modeled.
h. Maximum of 5-year means (or a lesser averaging period if less than 5 years of meteorological data were used in the analyses) of maximum modeled concentrations for each year modeled.
i. Maximum of 6th highest modeled concentrations for a 5-year period (or the maximum of the 2nd highest modeled concentrations if only 1 year of meteorological data are modeled).
j. Maximum of 5-year means (or a lesser averaging period if less than 5 years of meteorological data were used in the analyses) of 4th highest modeled concentrations for each year modeled.
k. Maximum of 2nd highest modeled concentrations for each year modeled.

Table 13. provides modeled impacts for TAPs having emissions rates exceeding the ELs.

Table 13. RESULTS FOR TAP IMPACT ANALYSES			
Pollutant	**Averaging Period**	**Modeled Design Concentration ($\mu g/m^3$)[a]**	**AAC/AACC[b] ($\mu g/m^3$)**
Acetaldehyde	Annual[c]	1.19E-2	4.5E-1
Arsenic	Annual[c]	2.51E-5	2.3E-4
Benzene	Annual[c]	3.81E-3	1.2E-1
Cadmium	Annual[c]	6.56E-6	5.6E-4
Chromium 6+	Annual[c]	6.93E-6	8.3E-5
Formaldehyde	Annual[c]	2.96E-2	7.7E-2
Nickel	Annual[c]	1.74E-3	4.2E-3
PAH[d]	Annual[c]	6.56E-3	1.4E-2
POM[e]	Annual[c]	5.14E-5	3.0E-4
Hydrochloric Acid	24-hour	2.25E-1	3.75+2
Quinone	24-hour	1.19E-1	2.0E+1

a. Micrograms/cubic meter
b. Acceptable Ambient Concentration or Acceptable Ambient Concentration for a Carcinogen as listed in Idaho Air Rules Section 585 or 586, respectively.
c. A period average across the five years of modeled meteorological data was used.
d. Polyaromatic Hydrocarbons. The driving PAH was naphthalene.

4.2 Locating with Other Facilities/Equipment

The air impact analyses performed by DEQ assume there are no other emissions sources in the immediate area that measurably contribute to pollutant concentrations in a way not adequately accounted for by the background concentrations used. Such emissions sources could include a rock crushing plant, another HMA plant, a ready-mix concrete plant, or other permitted facility. DEQ modeling staff established a rule-of-thumb distance of 1,000 feet from emissions sources at the HMA plant where emissions from a nearby source/facility would need to be considered in the air impact analyses for the HMA plant. Emissions sources located beyond 1,000 feet are considered too distant to have a measurable impact on receptors substantially impacted by the HMA plant.

HMA plants commonly co-locate with rock crushing plants. Since the short-term impacts are the governing criteria, simultaneously operation on an annual basis is not a large concern. DEQ modeling staff determined NAAQS compliance is still assured when a rock crushing plant locates with the HMA plant, provided the HMA plant does not operate during any day when the rock crushing plant is operating and the annual actual throughput of the rock crushing plant is not greater than 500,000 tons. DEQ modeling staff also determined NAAQS compliance is assured when operating the HMA plant during the same day as the rock crushing plant, provided the throughput of the HMA plant for that day is half that assumed for the modeling analyses used to generate setback distances.

Once the HMA plant is established at a site, the plant has no control over other facilities locating on neighboring properties (this does not include facilities locating on the same property as the HMA plant). Cumulative impacts would be assessed in the permitting analyses performed for the neighboring facility. The 1,000-foot restriction assumption on off-property co-contributing sources only applies when the HMA plant is relocating to a new site.

5.0 Conclusions

The ambient air impact analyses and other air quality analyses submitted with the PTC application demonstrated to DEQ's satisfaction that emissions from the IMC HMA will not cause or significantly contribute to a violation of any ambient air quality standard.

References

1. *Policy on NAAQS Compliance Demonstration Requirements.* Idaho Department of Environmental Quality Policy Memorandum. July 11, 2014.

2. *State of Idaho Guideline for Performing Air Quality Impact Analyses.* Idaho Department of Environmental Quality. September 2013. State of Idaho DEQ Air Doc. ID AQ-011. Available at http://www.deq.idaho.gov/media/1029/modeling-guideline.pdf.

ATTACHMENT 1

EMISSIONS CALCULATIONS AND MODELING PARAMETERS FOR

DEQ'S AIR IMPACT ANALYSES

HMA Plant Modeled Emissions Rates

Drum Dryer Emissions

IMC used the DEQ-provided HMA spreadsheet to calculate emissions rates for various averaging periods.

Asphalt Loadout

The DEQ HMA plant emissions calculation spreadsheet was used to generate emissions quantities for applicable averaging periods.

Asphalt Silo Filling

Emissions from silo-filling are captured and routed back into the drum dryer.

Asphalt Tank Heater Emissions

IMC calculated emissions from the asphalt oil heater based on 24 hour/day operation, using natural gas.

Power Generator

No stationary internal combustion engines will be operated at the facility.

Aggregate Handling Emissions

Emissions from aggregate handling were calculated for the following transfers: 1) aggregate to a storage pile by frontend loader; 2) aggregate from a pile to a hopper by frontend loader; 3) three conveyor transfers.

PM_{10} and $PM_{2.5}$ emissions associated with the handling of aggregate materials were calculated using emissions factors from AP42 Section 13.2.4.

Emissions were calculated using the following emissions equation:

$$E = k(0.0032)\left[\frac{(U/5)^{1.3}}{(M/2)^{1.4}}\right] \quad \text{lb/ton}$$

Where:

k = 0.053 for $PM_{2.5}$, 0.35 for PM_{10}
M = 3% for aggregate
U = wind speed (mph)

A moisture content of 3% to 7% was estimated as a typical moisture content of aggregate entering the dryer, per STAPPA-ALAPCO-EPA, Emission Inventory Improvement Program, Volume II, Chapter 3, Preferred and Alternative Methods for Estimating Air Emissions from Hot Mix Asphalt Plants, Final Report, July 1996. The lower level of moisture combined with an additional 90% emissions control was applied to calculated emissions from the conveyor transfers to account for additional emissions control measures required by Idaho regulations and the permit.

In the model, emissions are varied as a function of windspeed, with the base emissions entered for a windspeed of 10 mph.

upper windspeeds for 6 categories: 1.54, 3.09, 5.14, 8.23, 10.8 m/sec

Median windspeed for each category (1 m/sec = 2.237 mph)

Cat 1: (0 + 1.54)/2 = 0.77 m/sec ➢ 1.72 mph
Cat 2: (1.54 + 3.09)/2 = 2.32 m/sec ➢ 5.18 mph
Cat 3: (3.09 + 5.14)/2 = 4.12 m/sec ➢ 9.20 mph
Cat 4: (5.14 + 8.23)/2 = 6.69 m/sec ➢ 14.95 mph
Cat 5: (8.23 + 10.8)/2 = 9.52 m/sec ➢ 21.28 mph
Cat 6: (10.8 + 14)/2 = 12.4 m/sec ➢ 27.74 mph

Base $PM_{2.5}$ factor – use 10 mph wind: $0.053\left(0.0032\right)\frac{(10/5)^{1.3}}{(3/2)^{1.4}} = 2.367\,E-4$ lb/ton

Adjustment factors to put in the model:

Cat 1: $(1.72/5)^{1.3}$ (9.614 E-5) = 2.401 E-5 lb/ton
Factor = 2.401 E-5/2.367 E-4 = 0.1014

Cat 2: $(5.18/5)^{1.3}$ (9.614 E-5) = 1.007 E-4 lb/ton
Factor = 1.007 E-4 /2.367 E-4 = 0.4253

Cat 3: $(9.20/5)^{1.3}$ (9.614 E-5) = 2.124 E-4 lb/ton
Factor = 2.124 E-4/2.367 E-4 = 0.8974

Cat 4: $(14.95/5)^{1.3}$ (9.614 E-5) = 3.993 E-4 lb/ton
Factor = 3.993 E-4/2.367 E-4 = 1.687

Cat 5: $(21.28/5)^{1.3}$ (9.614 E-5) = 6.318 E-4 lb/ton
Factor = 6.318 E-4/2.367 E-4 = 2.669

Cat 6: $(27.74/5)^{1.3}$ (9.614 E-5) = 8.918 E-4 lb/ton
Factor = 8.918 E-4/2.367 E-4 = 3.768

For the operational scenario for 5,000 ton/day HMA and 300,000 ton/year HMA, emissions from the loader are as follows (daily and annual throughputs were based on aggregate being 96% of the total HMA production):

Daily $PM_{2.5}$:

2.367 E-4 lb $PM_{2.5}$	4,800 ton	day	2 transfers	=	0.09468 lb
ton	day	24 hr			hr

Annual $PM_{2.5}$:

2.367 E-4 lb $PM_{2.5}$	288,000 ton	yr	2 transfers	=	0.01556 lb
ton	yr	8,760 hour			hr

Emissions from the three conveyor transfers are as follows:

Daily $PM_{2.5}$:

$$\frac{2.367\text{ E-4 lb }PM_{2.5}}{\text{ton}}\ \Big|\ \frac{4{,}800\text{ ton}}{\text{day}}\ \Big|\ \frac{\text{day}}{24\text{ hr}}\ \Big|\ 3\text{ transfers}\ \Big|\ (1-0.90) = \frac{0.01420\text{ lb}}{\text{hr}}$$

Annual $PM_{2.5}$:

$$\frac{2.367\text{ E-4 lb }PM_{2.5}}{\text{ton}}\ \Big|\ \frac{288{,}000\text{ ton}}{\text{yr}}\ \Big|\ \frac{\text{yr}}{8{,}760\text{ hour}}\ \Big|\ 3\text{ transfers}\ \Big|\ (1-0.90) = \frac{0.002335\text{ lb}}{\text{hr}}$$

Total aggregate handling emissions:

Daily $PM_{2.5}$: 0.09468 lb/hr + 0.01420 lb/hr = 0.1089 lb/hr
Annual $PM_{2.5}$: 0.01556 lb/hr + 0.002335 lb/hr = 0.01789 lb/hr

Daily and annual throughputs were based on aggregate being 96% of the total HMA production.

These sources were modeled as a single volume source with a 20-meter square area, 5.0 meters thick, with a release height of 2.5 meters. The initial dispersion coefficients were calculated as follows:

σ_{yo} = 20 m / 4.3 = 4.65 m

σ_{zo} = 5 m / 4.3 = 1.16 m

Screening Emissions

This HMA plant uses one scalping screen. A $PM_{2.5}$ factor for uncontrolled emissions was not available in AP42. A $PM_{2.5}$ factor was estimated by DEQ permit writers and entered into the HMA calculation spreadsheet. The uncontrolled emissions factor was used and a 90% reduction applied to calculated emissions to account for additional emissions control measures required by Idaho regulations and the permit.

Daily and annual throughputs were based on aggregate being 96% of the total HMA production.

For the operational scenario for 5,000 ton/day HMA and 300,000 ton/year HMA, emissions are as follows:

Scalping Screen (controlled emissions):

Daily $PM_{2.5}$:

$$\frac{0.000130\text{ lb }PM_{2.5}}{\text{ton}}\ \Big|\ \frac{4{,}800\text{ ton}}{\text{day}}\ \Big|\ \frac{\text{day}}{24\text{ hour}}\ \Big|\ (1-0.90) = \frac{0.002600\text{ lb}}{\text{hr}}$$

Annual $PM_{2.5}$:

$$\frac{0.000130\text{ lb }PM_{2.5}}{\text{ton}}\ \Big|\ \frac{288{,}000\text{ ton}}{\text{yr}}\ \Big|\ \frac{\text{yr}}{8{,}760\text{ hour}}\ \Big|\ (1-0.90) = \frac{0.0004274\text{ lb}}{\text{hr}}$$

This source was modeled as a single volume source on or adjacent to a structure 5 m X 4 m, 5.0 meters thick, with a release height of 3.0 meters. The initial dispersion coefficients are calculated as follows:

σ_{yo} = 3 m / 4.3 = 0.70 m
σ_{zo} = 3 m / 4.3 = 0.70 m

HMA Plant Modeling Parameters

Dryer baghouse Stack

Release height = 9.75 meters; effective diameter of release area = 1.37 meters; typical stack gas temperature = 478 K; typical flow velocity = 9.22 meters/second

Asphalt Silo Filling

Emissions are captured and routed back to the drum dryer.

Asphalt Loadout

DEQ modeled this source as a point source.
- release height of 3.5 meters
- stack diameter of 3 meters, corresponding to the approximate diameter of the silo.
- gas temperature was estimated at half the AP42 default asphalt temperature: 325° F / 2 = 163° F
- stack velocity of 0.1 m/sec to account for convective air flow.

Aggregate to and from Storage and Conveyor Transfers

Release emissions in model from a 20 m X 20 m area 5 m high, released at 2.5 m

Initial dispersion coefficients:

σ_{y0} = 20 m / 4.3 = 4.65 m

σ_{z0} = 5 m / 4.3 = 1.16 m

Sources include: five transfers, equivalent in emissions to that of a frontend loader, from the point of aggregate delivery to transfer to the HMA plant hopper, and three conveyor transfers.

Asphalt Oil Heater

Parameters were provided by Knife River. Release height = 2.4 meters; effective diameter of release area = 0.27 meters; typical stack gas temperature = 614 K; typical flow velocity = 3.68 meters/second.

APPENDIX C – PROCESSING FEE

PTC Fee Calculation

Instructions:
Fill in the following information and answer the following questions with a Y or N. Enter the emissions increases and decreases for each pollutant in the table.

Company: **Staker Parson Companies dba**
Address: **1310 Addison Ave. West**
City: **Twin Falls**
State: **ID**
Zip Code: **83301**
Facility Contact: **Patrick Clark**
Title: **Environmental Advisor**
AIRS No.: **083-00193**

Y Does this facility qualify for a general permit (i.e. concrete batch plant, hot-mix asphalt plant)? Y/N

N Did this permit require engineering analysis? Y/N

N Is this a PSD permit Y/N (IDAPA 58.01.01.205.04)

Emissions Inventory			
Pollutant	Annual Emissions Increase (T/yr)	Annual Emissions Reduction (T/yr)	Annual Emissions Change (T/yr)
NO_X	0.0	0	0.0
SO_2	0.0	0	0.0
CO	0.0	0	0.0
PM10	0.0	0	0.0
VOC	0.0	0	0.0
TAPS/HAPS	0.0	0	0.0
Total:	0.0	0	**0.0**
Fee Due	**$ 500.00**		

Comments: